brother®

MULTI-FUNCTION CENTER

SERVICE MANUAL

MODEL: MFC9800/MFC9700/DCP1400
MFC9880/MFC9860/MFC9760

PREFACE

This publication is a Service Manual covering the specifications, construction, theory of operation, and maintenance of the Brother machine. It includes information required for field troubleshooting and repair--disassembly, reassembly, and lubrication--so that service personnel will be able to understand machine function, to rapidly repair the machine and order any necessary spare parts.

To perform appropriate maintenance so that the machine is always in best condition for the customer, the service personnel must adequately understand and apply this manual.

This manual is made up of six chapters and appendices.

CHAPTER I.	**GENERAL DESCRIPTION**
CHAPTER II.	**INSTALLATION**
CHAPTER III.	**THEORY OF OPERATION**
CHAPTER IV.	**DISASSEMBLY/REASSEMBLY AND LUBRICATION**
CHAPTER V.	**MAINTENANCE MODE**
CHAPTER VI.	**ERROR INDICATION AND TROUBLESHOOTING**
Appendix 1.	**EEPROM Customizing Codes**
Appendix 2.	**Firmware Switches (WSW)**
Appendix 3.	**Circuit Diagrams**

This manual describes the models and their versions to be destined for major countries. The specifications and functions are subject to change depending upon each destination.

SAFETY INFORMATION

Laser Safety (110-120V Model only)

This printer is certified as a Class 1 laser product under the US Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within the protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

CDRH Regulations (110-120V Model only)

The Center for Device and Radiological Health (CDRH) of the US Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States. The label shown below indicates compliance with the CDRH regulations and must be attached to laser products marketed in the United States.

The label for Chinese products

MANUFACTURED: JULY 2001 C
BROTHER CORP. (ASIA) LTD.
BROTHER BUJI NAN LING FACTORY
Gold Garden Industry, Nan Ling Village, Buji,
Rong Gang, Shenzhen, China.
This product complies with FDA radiation
performance standards, 21 CFR Subchapter J.

CHAPTER I.

GENERAL DESCRIPTION

CHAPTER I. GENERAL DESCRIPTION

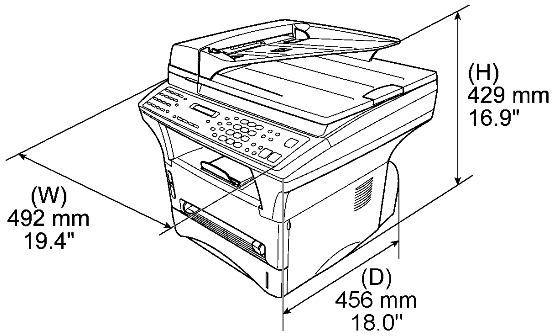
CONTENTS

1. **MACHINE OUTLINE** **I-1**
   - 1.1 External Appearance and Weight I-1
   - 1.2 Components I-1
2. **SPECIFICATIONS** **I-2**

1. MACHINE OUTLINE

1.1 External Appearance and Weight

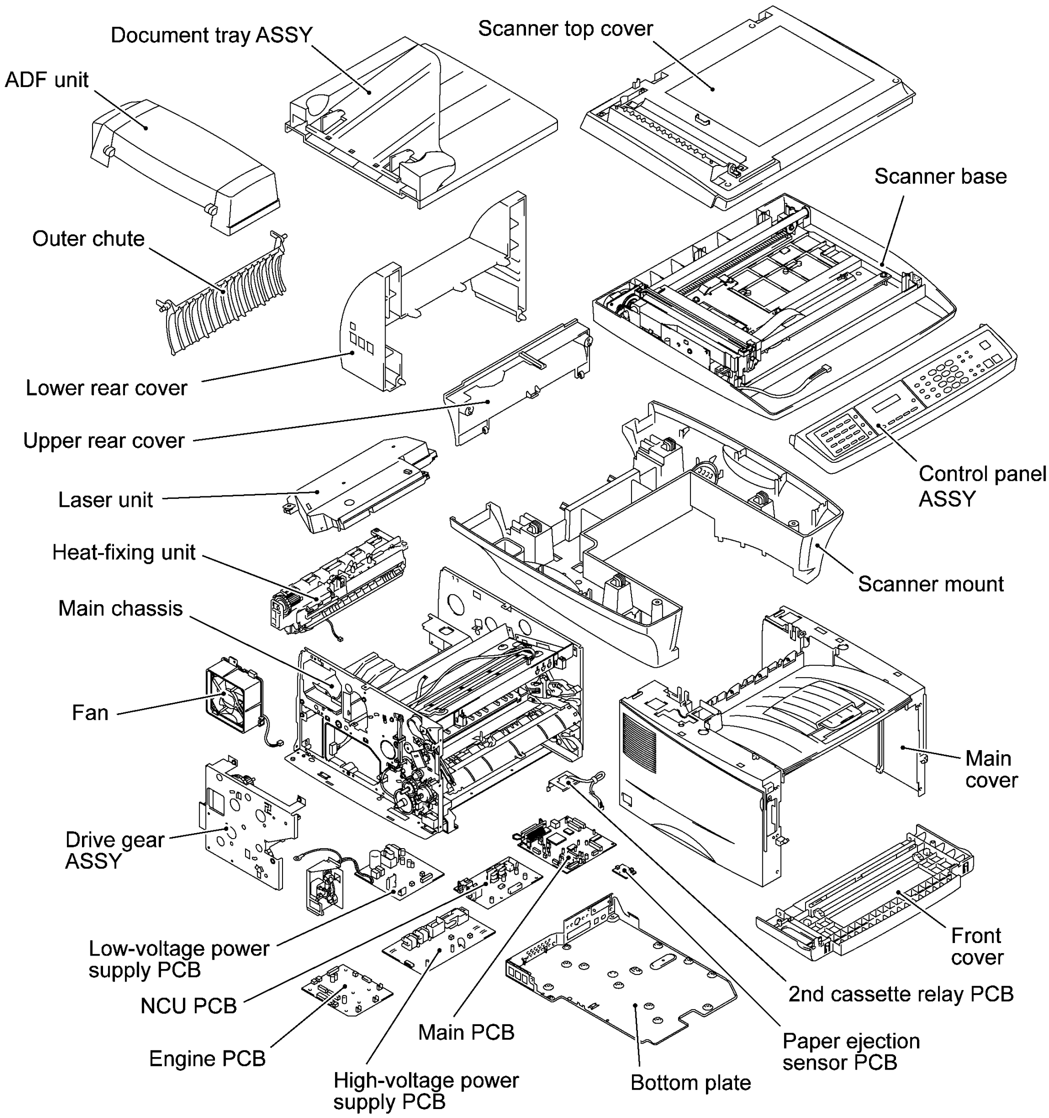
The figure below shows the machine appearance and approximate dimensions.



Weight:	Machine proper	15.2 kg
	Machine (incl. drum unit & toner cartridge)	17.0 kg
	In package	21.2 kg

1.2 Components

The machine consists of the following major components:



2. SPECIFICATIONS

(1/4)

Model Name	MFC9800	MFC9700
GENERAL		
Print Engine	Laser (ZLe)	Laser (ZLe)
Modem Speed(bps)	33,600(Fax)	14,400(Fax)
Transmission Speed(sec.)	Approx. 2	Approx. 5
ITU-T Group	Super G3	G3
Coding Method	MH/MR/MMR/JBIG	MH/MR/MMR/JBIG
Input/Output Width	5.8"-8.5"/2.75"-8.5"	5.8"-8.5"/2.75"-8.5"
ADF(pages)	up to 50	up to 50
LCD Size	16 Characters x 2 Lines	16 Characters x 1 Lines
On-Screen Programming	Yes	Yes
Back up Clock	Yes (9 hours)	Yes (1 hours)
Memory Capacity(Physical:MByte)	8	8
Back up Memory	*Yes*	No
Optional Memory	*16/32MByte(DIMM)*	No
Optional Paper Tray	Yes(250pages:LT-400)	Yes(250pages:LT-400)
Dimensions (WxDxH)	19.4x18.0x16.8 inches 492x456x429 mm	19.4x18.0x16.8 inches 492x456x429 mm
Weight	35.2 lbs/(17 kg)	35.2 lbs/(17 kg)
Color	Gray 1495	Gray 1495
Standby Mode	Yes	Yes
PC-Fax Protocol Compliance	Class 2	Class 2
Simultaneous Operation	Yes	Yes
Data Modem	No	No
Energy Star Compliance (for U.S.A.)	Yes	Yes
LCD Back Light	No	No
Operating Environment Temperature Humidity	10 - 32.5 degrees Centigrade 20 - 80%(without condensation)	10 - 32.5 degrees Centigrade 20 - 80%(without condensation)
Power Source	120VAC 50/60Hz	120VAC 50/60Hz
Power Consumption (Sleep/Standby/Peak)	**Less than 15W / 75W / 940W**	**Less than 15W / 75W / 940W**
Demo Model	N / A	Yes([Start]+[Stop])
TELEPHONE		
Automatic Redial	Yes	Yes
Handset	No	No
One-Touch Dial	32 (16x2)	8 (4x2)
Speed Dial	100	100
Telephone Index	Yes	Yes
Speaker Phone	No	No
Chain Dialing	Yes	Yes
Caller ID	Yes	Yes
Call Waiting Caller ID	No	No
Distinctive Ringing	Yes	Yes
Hold/Mute Key	No	No
Power Failure Dialing	No	No
Speaker Volume	-	-
Ring Volume	-	-
Handset Volume	-	-
PBX Feature	No	No
Transfer Method	Flash	Flash
Figures of One-Touch & Speed Dial	20 digits	20 digits
Resisterable Number Of Characters	15 char	15 char

Model Name	*DCP1400*
GENERAL	
Print Engine	Laser (ZLe)
Modem Speed(bps)	-
Transmission Speed(sec.)	-
ITU-T Group	-
Coding Method	-
Input/Output Width	5.8"-8.5"/2.75"-8.5"
ADF(pages)	up to 50
LCD Size	16 Characters x 2 Lines
On-Screen Programming	Yes
Backup Clock	No
Memory Capacity(Physical:MByte)	8
Backup Memory	No
Optional Memory	No
Optional Paper Tray	Yes(250pages:LT-400)
Dimensions (WxDxH)	19.4x18.0x16.8 inches 492x456x429 mm
Weight	35.2 lbs/(17 kg)
Color	Gray 1495
Standby Mode	Yes
PC-Fax Protocol Compliance	-
Simultaneous Operation	Yes
Data Modem	No
Energy Star Compliance (for U.S.A.)	Yes
LCD Back Light	No
Operating Environment Temperature Humidity	10 - 32.5 degrees Centigrade 20 - 80%(without condensation)
Power Source	120VAC 50/60Hz
Power Consumption (Sleep/Standby/Peak)	**Less than 15W / 75W / 940W**
Demo Model	N / A
TELEPHONE	
Automatic Redial	-
Handset	-
One-Touch Dial	-
Speed Dial	-
Telephone Index	-
Speaker Phone	-
Chain Dialing	-
Caller ID	-
Call Waiting Caller ID	-
Distinctive Ringing	-
Hold/Mute Key	-
Power Failure Dialing	-
Speaker Volume	-
Ring Volume	-
Handset Volume	-
PBX Feature	-
Transfer Method	-
Figures of One-Touch & Speed Dial	-
Resisterable Number Of Characters	-

Model Name	MFC9800	MFC9700
FAX		
Internet FAX	Available with Optional LAN Board	Available with Optional LAN Board
Easy Receive/Fax Detect	Yes	Yes
Fax/Tel Switch	Yes	No
Super Fine	Yes (TX & RX)	Yes (TX & RX)
300dpi Transmission	No	No
Gray Scale	64	64
Contrast	Yes (Auto/S.Light/S.Dark)	Yes (Auto/S.Light/S.Dark)
Smoothing	Yes	Yes
Call Reservation Over Auto TX	No	No
Password Check	No	No
Enhanced Remote Activate	Yes	Yes
Multi Resolution Transmission	No	No
Multi Transmission	No	No
Next-Fax Reservation	Yes (Dual Access)	Yes (Dual Access)
Delayed Timer	Yes (up to 50)	Yes (up to 50)
Polling (RX only)	Yes (Std/Seq)	Yes (Std/Seq)
Quick Scan (Memory Transmission)	Approx. 3 sec./page (A4:standard)	Approx. 3 sec./page (A4:standard)
Broadcasting	Yes (182 locations)	Yes (158 locations)
Batch Transmission	Yes	Yes
Auto Reduction	Yes	Yes
Out-of-Paper Reception *2	up to 600 pages	up to 600 pages
Dual Access	Yes	Yes
ECM(Error Correction Mode)	Yes	Yes
ITU SUB Addressing	No	No
Group Dial	Yes (6)	Yes (6)
Resend After Receive Error Signal	No	No
Confidential	No	No
Station ID	1 (20digits/20char)	1 (20digits/20char)
Off Hook Alarm	No	No
Remote Maintenance	Yes	Yes
Call Reservation Over Manual TX	No	No
RX Mode Indication	LCD	LCD
Resolution Indication	LED	LCD
LIST REPORT		
Activity Report/Journal Report	Yes (up to 200)	Yes (up to 200)
Transmission Verification Report	Yes	Yes
Coverpage	Yes (Super)	Yes (Super)
Help List	Yes	Yes
Call Back Message	No	No
Caller ID List	Yes	Yes
INTERFACE		
External TAD Interface	Yes	Yes
Missing Link/PC Interface	No	No
Host Interface	Yes (Auto switching : Parallel/USB *3)	Yes (Auto switching : Parallel/USB *3)
LAN Interface	Available with Option LAN Board	Available with Option LAN Board

Model Name	DCP1400
FAX	
Internet FAX	-
Easy Receive/Fax Detect	-
Fax/Tel Switch	-
Super Fine	-
300dpi Transmission	-
Gray Scale	-
Contrast	-
Smoothing	-
Call Reservation Over Auto TX	-
Password Check	-
Enhanced Remote Activate	-
Multi Resolution Transmission	-
Multi Transmission	-
Next-Fax Reservation	-
Delayed Timer	-
Polling (RX only)	-
Quick Scan (Memory Transmission)	-
Broadcasting	-
Batch Transmission	-
Auto Reduction	-
Out-of-Paper Reception *2	-
Dual Access	-
ECM(Error Correction Mode)	-
ITU SUB Addressing	-
Group Dial	-
Resend After Receive Error Signal	-
Confidential	-
Station ID	-
Off Hook Alarm	-
Remote Maintenance	-
Call Reservation Over Manual TX	-
RX Mode Indication	-
Resolution Indication	-
LIST REPORT	
Activity Report/Journal Report	-
Transmission Verification Report	-
Coverpage	-
Help List	-
Call Back Message	-
Caller ID List	-
INTERFACE	
External TAD Interface	No
Missing Link/PC Interface	No
Host Interface	Yes (Auto switching : Parallel/USB *3)
LAN Interface	No

Model Name	MFC9800	MFC9700
PRINTER	**Yes**	**Yes**
Color/Mono	Mono	Mono
Engine Type	Laser(ZL)	Laser(ZL)
Resolution(dpi)	600x600	600x600
Speed(ppm)	up to 14	up to 14
Paper Capacity(sheets)	250	250
Additional Paper Capacity(sheets)	250 (User Option)	250 (User Option)
Output Paper Capacity(sheets)	150	150
Standard Print Language	Windows GDI(600x600)	Windows GDI(600x600)
Emulation	PCL5e	PCL4
Resident Fonts	24 Bitmap (PCL5 Comp.)	24 Bitmap (PCL4 Comp.)
Fonts Disk Based	Yes (35 TrueType)	Yes (35 TrueType)
Paper Handling Size	LTR, LGL, A4, B5, A5, EXE	LTR, LGL, A4, B5, A5, EXE
Manual Feed Slot	Custom Size (2.75x5 - 8.5x14) Envelop(DL/C5/CM10/Mona)	Custom Size (2.75x5 - 8.5x14) Envelop(DL/C5/CM10/Mona)
Other Paper Type	OHP, Envelopes, Labels, Organizer	OHP, Envelopes, Labels, Organizer
Sheet Weight (Paper Cassette) (Manual Slot)	64-105 g/m2 (17 - 28 lb) 64-157 g/m2 (17 - 43 lb)	64-105 g/m2 (17 - 28 lb) 64-157 g/m2 (17 - 43 lb)
Printer Driver	Win95/98(SE)/Me and NT4.0/2000 Driver with Auto Installer Program	Win95/98(SE)/Me and NT4.0/2000 Driver with Auto Installer Program
Utility Software	Yes (Remote Printer Console for PCL6)	Yes (Remote Printer Console for PCL4)
Toner Life (Standard Yield : TN-430) (High Yield : TN-460)	6,000 A4 pages@5% 3,000 A4 pages@5%	6,000 A4 pages@5% 3,000 A4 pages@5%
Drum Life (DR400)	up to 20,000 pages	up to 20,000 pages
Interface Type	Parallel & USB *3	Parallel & USB *3
Bundled Cable	Yes (Parallel)	Yes (Parallel)
COPY		
Speed(cpm)	up to 14	up to 14
Multi Copy(Stack)	up to 99	up to 99
Multi Copy(Sort)	Yes	Yes
Multi Copy(2in1)	Yes	Yes
Multi Copy(4in1)	Yes	Yes
Poster	Yes	Yes
Reduction/Enlargement(%)	25 -- 400 in 1% increments	25 -- 400 in 1% increments
Resolution(dpi)	600x600(600x300:Optical Scanning)	600x600(600x300:Optical Scanning)
SCANNER	**Yes**	**Yes**
Color/Mono	Color	Color
Resolution(Optical : dpi) Resolution(Int. : dpi)	600x300(Max. 600x2,400) 9,600x9,600	600x300(Max. 600x2,400) 9,600x9,600
Color Depth(bit)	24(8bitx3)	24(8bitx3)
Gray Scale	256	256
TWAIN Compliant	Yes	Yes
Formats(Import)	TIFF/BMP/PCX/DCX/BTF/BTX/MAX	TIFF/BMP/PCX/DCX/BTF/BTX/MAX
Formats(Export)	TIFF/BMP/MAX	TIFF/BMP/MAX
OCR	Yes(ScanSoft TextBridge)	Yes(ScanSoft TextBridge)
[Scan] Key	es(Scan to E-mail, Scan Image, Scan/OCR	es(Scan to E-mail, Scan Image, Scan/OCR

Model Name	DCP1400
PRINTER	Yes
Color/Mono	Mono
Engine Type	Laser(ZL)
Resolution(dpi)	600x600
Speed(ppm)	up to 14
Paper Capacity(sheets)	250
Additional Paper Capacity(sheets)	250 (User Option)
Output Paper Capacity(sheets)	150
Standard Print Language	Windows GDI(600x600)
Emulation	PCL4
Resident Fonts	24 Bitmap (PCL4 Comp.)
Fonts Disk Based	Yes (35 TrueType)
Paper Handling Size	LTR, LGL, A4, B5, A5, EXE
Manual Feed Slot	Custom Size (2.75x5 - 8.5x14) Envelop(DL/C5/CM10/Mona)
Other Paper Type	OHP, Envelopes, Labels, Organizer
Sheet Weight (Paper Cassette) (Manual Slot)	64-105 g/m2 (17 - 28 lb) 64-157 g/m2 (17 - 43 lb)
Printer Driver	Win95/98(SE)/Me and NT4.0/2000 Driver with Auto Installer Program
Utility Software	Yes (Remote Printer Console for PCL4)
Toner Life (Standard Yield : TN-430) (High Yield : TN-460)	6,000 A4 pages@5% 3,000 A4 pages@5%
Drum Life (DR400)	up to 20,000 pages
Interface Type	Parallel & USB *3
Bundled Cable	Yes (Parallel)
COPY	
Speed(cpm)	up to 14
Multi Copy(Stack)	up to 99
Multi Copy(Sort)	Yes
Multi Copy(2in1)	Yes
Multi Copy(4in1)	Yes
Poster	Yes
Reduction/Enlargement(%)	25 -- 400 in 1% increments
Resolution(dpi)	600x600(600x300:Optical Scanning)
SCANNER	Yes
Color/Mono	Color
Resolution(Optical : dpi) Resolution(Int. : dpi)	600x300(Max. 600x2,400) 9,600x9,600
Color Depth(bit)	24(8bitx3)
Gray Scale	256
TWAIN Compliant	Yes
Formats(Import)	TIFF/BMP/PCX/DCX/BTF/BTX/MAX
Formats(Export)	TIFF/BMP/MAX
OCR	Yes(ScanSoft TextBridge)
[Scan] Key	es(Scan to E-mail, Scan Image, Scan/OCR

Model Name	*MFC9800*	*MFC9700*
MESSAGE CENTER/MESSAGE MANAGER	**No**	**No**
ICM Recording Time	No	No
Page Memory	No	No
OGM (MC/MC Pro/Paging)	No	No
TAD Type	No	No
Memo/Recording Conversation	No	No
Toll Saver	No	No
Fax Forwarding	Yes	Yes
Fax Retrieval	Yes	Yes
Paging	Yes	Yes
Remote Access	Yes	Yes
MESSAGE CENTER Pro/MESSAGE MANAGER Pro	**No**	**No**
Fax/Voice Mail Box	No	No
Fax/Voice on Demand	No	No
MESSAGE CENTER (PC MC)	**No**	**No**
Fax Forwarding	No	No
Paging	No	No
ICM Recording Time	No	No
OGM MC/MC Pro/Paging	No	No
Fax/Voice Mail Box	No	No
Fax/Voice on Demand	No	No
VIDEO CAPTURE	**No**	**No**
Video Capture	No	No
Video Print	No	No
Video Format	No	No
BUNDLED SOFTWARE		
For Windows		
OS Support	Win95/98(SE)/Me, WinNT4.0/2000	Win95/98(SE)/Me, WinNT4.0/2000
Printer Driver (Brother)	Yes	Yes
Viewer (ScanSoft PaperPort Ver.6.5) - include Text Bridge OCR	Yes	Yes
TWAIN (Brother)	Yes	Yes
PC Fax (Brother) - TX: FAX Share / RX: Class2	Yes	Yes
For iMAC/G3/G4		
OS Support Printer Driver TWAIN	8.5 - 9.1 8.6 - 9.1	8.5 - 9.1 8.6 - 9.1
Printer Driver (Brother)	Yes	Yes
Viewer (ScanSoft PaperPort for MAC)	Yes	Yes
TWAIN (TII/Brother)	Yes	Yes
PC Fax (TX[FAX Share] only:Brother)	Yes	Yes

*2: Brother #1 Chart, JBIG coding, Standard Resolution

*3: USB - Windows98/98SE/Me, Windows2000 only.

Model Name	DCP1400
MESSAGE CENTER/MESSAGE MANAGER	No
ICM Recording Time	-
Page Memory	-
OGM (MC/MC Pro/Paging)	-
TAD Type	-
Memo/Recording Conversation	-
Toll Saver	-
Fax Forwarding	-
Fax Retrieval	-
Paging	-
Remote Access	-
MESSAGE CENTER Pro/MESSAGE MANAGER Pro	No
Fax/Voice Mail Box	-
Fax/Voice on Demand	-
MESSAGE CENTER (PC MC)	No
Fax Forwarding	-
Paging	-
ICM Recording Time	-
OGM MC/MC Pro/Paging	-
Fax/Voice Mail Box	-
Fax/Voice on Demand	-
VIDEO CAPTURE	No
Video Capture	No
Video Print	No
Video Format	No
BUNDLED SOFTWARE	
For Windows	
OS Support	Win95/98(SE)/Me, WinNT4.0/2000
Printer Driver (Brother)	Yes
Viewer (ScanSoft PaperPort Ver.6.5) - include Text Bridge OCR	Yes
TWAIN (Brother)	Yes
PC Fax (Brother) - TX: FAX Share / RX: Class2	**No**
For iMAC/G3/G4	
OS Support Printer Driver TWAIN	8.5 - 9.1 8.6 - 9.1
Printer Driver (Brother)	Yes
Viewer (ScanSoft PaperPort for MAC)	Yes
TWAIN (TII/Brother)	Yes
PC Fax (TX[FAX Share] only:Brother)	**No**

*2: Brother #1 Chart, JBIG coding, Standard Resolution

*3: USB - Windows98/98SE/Me, Windows2000 only.

	ZLe-FB(w/ Modem)	ZLe-FB(w/ Modem)
Model Name	**MFC- 9880**	**MFC-9860**
GENERAL		
Print Engine	Laser (ZL)	Laser (ZL)
Modem Speed(bps)	33,600(Fax)	33,600(Fax)
Transmission Speed(sec.)	Approx. 2 (brother#1 chart, JBIG)	Approx. 2 (brother#1 chart, JBIG)
ITU-T Group	Supper G3	Supper G3
Coding Method	MH/MR/MMR/JBIG	MH/MR/MMR/JBIG
Input/Output Width	FB;8.5"X11"ADF;5.8"-8.5/2.75"-8.5"	FB;8.5"X11"ADF;5.8"-8.5/2.75"-8.5"
ADF(pages)	up to 50	up to 50
LCD size	16 Characters x 2 lines	16 Characters x 2 lines
On-Screen Programming	Yes	Yes
Back up Clock	Yes (9 hours)	Yes (9 hours)
Memory Capacity(physical)	8MB(RAM)	8MB(RAM)
Memory Backup	Yes(Max. 4 days)	Yes(Max. 4 days)
Optional Memory	Yes (16/32MB:DIMM)	Yes (16/32MB:DIMM)
Dimensions w/ Carton (WxDxH)	598 x 567 x 580 mm	598 x 567 x 580 mm
Dimensions w/o Carton (WxDxH)	492 x 456 x 429 mm	492 x 456 x 429 mm
Weight w/o Carton (WxDxH)	17.0Kg	17.0Kg
Weight w/ Carton (WxDxH)	21.2Kg	21.2Kg
Color	Gray 1495	Gray 1495
Standby Mode	Yes	Yes
PC-Fax Protocol Compliance	Class 2	No
Simultaneous Operation	Yes (Print/Fax,Print/Copy,Print/Scan)	No
Data Modem	No	No
Energy Star Compliant	N/A	N/A
LCD Back Light	No	No
Operating Environment Temperature Humidity	10 - 32.5 degrees Centigrade 20% - 80%	10 - 32.5 degrees Centigrade 20% - 80%
Power Source	220-240VAC 50/60Hz	220-240VAC 50/60Hz
Power Consumption (Sleep/Standby/Peak)	15W/75W/940W	15W/75W/940W
Demo Print	No	No
TELEPHONE		
Automatic Redial	Yes	Yes
Handset	No	No
One-Touch Dial	32 (16x2)	32 (16x2)
Speed Dial	100	100
Telephone Index	Yes(Normal)	Yes(Normal)
Speaker Phone	No	No
Chain Dialing	Yes	Yes
Caller ID	No	No
Call Waiting Caller ID	No	No
Distinctive Ringing	Yes(UK, DEN only)	Yes(UK, DEN only)
Hold/Mute Key	No	No
Power Failure Dialing	No	No
Speaker Volume	Yes (3 steps + OFF)	Yes (3 steps + OFF)
Ring Volume	Yes (3 steps + OFF)	Yes (3 steps + OFF)
Handset Volume	No	No
PBX Feature	Yes	Yes
Transfer Method	Flash	Flash
Figures of One-Touch & Speed Dial	20 digits	20 digits
Resisterable Number Of Characters	15 characters	15 characters

	ZLe-FB(w/out Modem)
Model Name	**MFC-9760**
GENERAL	
Print Engine	Laser (ZL)
Modem Speed(bps)	-
Transmission Speed(sec.)	-
ITU-T Group	-
Coding Method	-
Input/Output Width	FB;8.5"X11"ADF;5.8"-8.5/2.75"-8.5"
ADF(pages)	up to 50
LCD size	16 Characters x 2 lines
On-Screen Programming	Yes
Back up Clock	Yes (1 hour)
Memory Capacity(physical)	8MB(RAM)
Memory Backup	No
Optional Memory	Yes (16/32MB:DIMM)
Dimensions w/ Carton (WxDxH)	598 x 567 x 580 mm
Dimensions w/o Carton (WxDxH)	492 x 456 x 429 mm
Weight w/o Carton (WxDxH)	17.0Kg
Weight w/ Carton (WxDxH)	21.2Kg
Color	Gray 1495
Standby Mode	Yes
PC-Fax Protocol Compliance	-
Simultaneous Operation	Yes (Print/Copy,Print/Scan)
Data Modem	-
Energy Star Compliant	N/A
LCD Back Light	No
Operating Environment Temperature Humidity	10 - 32.5 degrees Centigrade 20% - 80%
Power Source	220-240VAC 50/60Hz
Power Consumption (Sleep/Standby/Peak)	15W/75W/940W
Demo Print	No
TELEPHONE	***N/A***
Automatic Redial	-
Handset	-
One-Touch Dial	-
Speed Dial	-
Telephone Index	-
Speaker Phone	-
Chain Dialing	-
Caller ID	-
Call Waiting Caller ID	-
Distinctive Ringing	-
Hold/Mute Key	-
Power Failure Dialing	-
Speaker Volume	-
Ring Volume	-
Handset Volume	-
PBX Feature	-
Transfer Method	-
Figures of One-Touch & Speed Dial	-
Resisterable Number Of Characters	-

Model Name	MFC- 9880	MFC-9860
FAX	**Yes**	**Yes**
Internet FAX	Available with Option(NC-8100h)	No
Easy Receive/Fax Detect	Yes	Yes
Fax/Tel Switch	Yes with TEL/R key	Yes with TEL/R key
Super Fine	Yes (TX & RX)	Yes (TX & RX)
300dpi Transmission	No	No
Gray Scale	64	64
Contrast	Yes (Auto/Light/Dark)	Yes (Auto/Light/Dark)
Smoothing	Yes	Yes
Call Reservation Over Auto TX	No	No
Password Check	No	No
Enhanced Remote Activate	Yes	Yes
Multi Resolution Transmission	No	No
Multi Transmission(>Dual Access)	No	No
Next-Fax Reservation(>Dual Access)	No	No
Delayed Timer	Yes (50 timers/ 50 jobs)	Yes (50 timers/ 50 jobs)
Polling	Yes (Std/Seq/Sec/Del)	Yes (Std/Seq/Sec/Del)
Quick-Scan(Memory Transmission) *1 by ADF	Yes as default, approx. 2.8sec/page(A4 standard)	Yes as default, approx. 2.8sec/page(A4 standard)
by Flatbed	Yes as default, approx. 3.8sec/page(A4 standard)	Yes as default, approx. 3.8sec/page(A4 standard)
Broadcasting	Yes (182 locations)	Yes (182 locations)
Batch Transmission	Yes	Yes
Auto Reduction	Yes	Yes
Out-of-Paper Reception (ITU-T Chart) *2	500 pages(JBIG/Standard Resolution)	500 pages(JBIG/Standard Resolution)
Dual Access	Yes	Yes
ECM(Error Correction Mode)	Yes	Yes
ITU SUB Addressing	No	No
Group Dial	Yes (6)	Yes (6)
Station ID	Yes (20digits/20characters)	Yes (20digits/20characters)
Off Hook Alarm	No	No
Remote Maintenance	Yes	Yes
Call Reservation Over Manual TX	No	No
RX Mode Indication	LCD	LCD
Resolution Indication	LED	LED
LIST/REPORT		
Activity Report/Journal Report	Yes (up to 200)	Yes (up to 200)
Transmission Verification Report	Yes	Yes
Coverpage	Yes (Super)	Yes (Super)
Help List	Yes(Reports key)	Yes(Reports key)
Call Back Message	No	No
Caller ID List	No	No
INTERFACE		
External TAD Interface	Yes	Yes
Missing Link/PC Interface(=Serial I/F)	No	No
Host Interface (Serial)	No	No
Host Interface (IEEE1284)	Yes	No
Host Interface (USB)	Yes	No
LAN Interface	Available with Optional NC-8100h	No

Model Name	**MFC-9760**
FAX	***N/A***
Internet FAX	-
Easy Receive/Fax Detect	-
Fax/Tel Switch	-
Super Fine	-
300dpi Transmission	-
Gray Scale	-
Contrast	-
Smoothing	-
Call Reservation Over Auto TX	-
Password Check	
Enhanced Remote Activate	-
Multi Resolution Transmission	-
Multi Transmission(>Dual Access)	-
Next-Fax Reservation(>Dual Access)	-
Delayed Timer	
Polling	-
Quick-Scan(Memory Transmission) *1 by ADF	-
by Flatbed	-
Broadcasting	-
Batch Transmission	
Auto Reduction	-
Out-of-Paper Reception (ITU-T Chart) *2	-
Dual Access	-
ECM(Error Correction Mode)	-
ITU SUB Addressing	-
Group Dial	-
Station ID	-
Off Hook Alarm	-
Remote Maintenance	-
Call Reservation Over Manual TX	-
RX Mode Indication	-
Resolution Indication	-
LIST/REPORT	**No**
Activity Report/Journal Report	-
Transmission Verification Report	-
Coverpage	-
Help List	N/A
Call Back Message	-
Caller ID List	-
INTERFACE	
External TAD Interface	No
Missing Link/PC Interface(=Serial I/F)	No
Host Interface (Serial)	No
Host Interface (IEEE1284)	Yes
Host Interface (USB)	Yes
LAN Interface	No

Model Name	**MFC- 9880**	**MFC-9860**
PRINTER	**Yes**	***N/A***
Color/Mono	Mono	No
Engine Type	Laser(ZLe)	No
Resolution(dpi)	600x600	No
Speed(ppm)	up to 14	No
Paper Capacity(sheets)	250	250
Additional Paper Capacity(sheets)	250 (User Option)	250 (User Option)
Output Paper Capacity(sheets)	150	150
Standard Print Language	Windows GDI(600x600)	No
Emulation	PCL5e	No
Resident Fonts	Yes (Bitmap font: LetterGothic 16.66, OCR-A, OCR-B, Scalable font: 49 fonts)	No
Fonts Disk Based	Yes (35 fonts)	No
Paper Handling Size	LTR, EXE, A4, A5,A6, ISO B5, ISO B6	No
Manual Feed Slot	Custom Size (2.75x5 - 8.5x14) Envelop (DL/C5/CM10/Mona)	No
Other Paper Type	OHP, Envelopes, Labels, Organizer	No
Sheet Weight (Paper Cassette)	60 -105 g/m2	No
(ADF)	64 - 90 g/m2	No
(Manual Slot)	60 -161 g/m2	No
Printer Driver	Win95/98(SE)/Me/NT4.0WS/2000Professinal MacOS 8.5-9.1	No
Utility Software	Yes (Remote Printer Console for PCL5e)	No
Toner Life (Standard Yield : TN-6300) (High Yield : TN-6600)	3,000 pages/A4@5% 6,000 pages/A4@5%	3,000 pages/A4@5% 6,000 pages/A4@5%
Drum Life (DR-6000)	up to 20,000 pages	up to 20,000 pages
Bundled Cable	No	No
COPY	**Yes**	**Yes**
Color/Mono	Mono	Mono
Multi Copy(Stack)	Yes (up to 99)	Yes (up to 99)
Multi Copy(Sort)	Yes	Yes
N in 1	2in1, 4in1	2in1, 4in1
Poster (X by Y)	Yes (1in3x3)	Yes (1in3x3)
Reduction/Enlargement(%)	25 -- 400 in 1% increments	25 -- 400 in 1% increments
Resolution(dpi)	600x300	600x300
SCANNER	**Yes**	***N/A***
Color/Mono	Color/Mono	No
Resolution(Optical: dpi)	600x2,400	No
Resolution(Interpolated: dpi)	9,600x9,600	No
Colour Depth(bit)	24(8bit x 3)	No
Gray Scale	256	No
TWAIN Compliant & Operating System	Win95/98(SE)/ME/NT4.0WS/2000Professional MacOS8.6-9.1	No
OCR	Yes (TextBridge by ScanSoft)	No
Scan Key	No	No
Scan to Image key	Yes	No
Scan to OCR key	Yes	No
Scan to E-MAIL key	Yes	No

Model Name	**MFC-9760**
PRINTER	**Yes**
Color/Mono	Mono
Engine Type	Laser(ZLe)
Resolution(dpi)	600x600
Speed(ppm)	up to 14
Paper Capacity(sheets)	250
Additional Paper Capacity(sheets)	250 (User Option)
Output Paper Capacity(sheets)	150
Standard Print Language	Windows GDI(600x600)
Emulation	PCL5e
Resident Fonts	Yes (Bitmap font: LetterGothic 16.66, OCR-A, OCR-B, Scalable font: 49 fonts)
Fonts Disk Based	Yes (35 fonts)
Paper Handling Size	LTR, EXE, A4, A5,A6, ISO B5, ISO B6
Manual Feed Slot	Custom Size (2.75x5 - 8.5x14) Envelop (DL/C5/CM10/Mona)
Other Paper Type	OHP, Envelopes, Labels, Organizer
Sheet Weight (Paper Cassette)	60 -105 g/m2
(ADF)	64 - 90 g/m2
(Manual Slot)	60 -161 g/m2
Printer Driver	Win95/98(SE)/Me/NT4.0WS/2000Professinal MacOS 8.5-9.1
Utility Software	Yes (Remote Printer Console for PCL5e)
Toner Life (Standard Yield : TN-6300)	3,000 pages/A4@5%
(High Yield : TN-6600)	6,000 pages/A4@5%
Drum Life (DR-6000)	up to 20,000 pages
Bundled Cable	No
COPY	**Yes**
Color/Mono	Mono
Multi Copy(Stack)	Yes (up to 99)
Multi Copy(Sort)	Yes
N in 1	2in1, 4in1
Poster (X by Y)	Yes (1in3x3)
Reduction/Enlargement(%)	25 – 400 in 1% increments
Resolution(dpi)	600x300
SCANNER	Yes
Color/Mono	Color/Mono
Resolution(Optical: dpi)	600x2,400
Resolution(Interpolated: dpi)	9,600x9,600
Colour Depth(bit)	24(8bit x 3)
Gray Scale	256
TWAIN Compliant & Operating System	Win95/98(SE)/ME/NT4.0WS/2000Professional MacOS8.6-9.1
OCR	ScanSoft(TextBridge)
Scan Key	No (possible only by POP UP Menu on PC)
Scan to Image key	No
Scan to OCR key	No
Scan to E-MAIL key	No

Model Name	MFC- 9880	MFC-9860
MESSAGE CENTER/MESSAGE MANAGER		
ICM Recording Time	N / A	N / A
Page Memory	N / A	N / A
OGM (MC;MC Pro;Paging;F/T)	N / A	N / A
TAD Type	N / A	N / A
Memo/Recording Conversation	N / A	N / A
Toll Saver	N / A	N / A
Fax Forwarding	Yes	Yes
Fax Retrieval	Yes	Yes
Paging	No	No
Remote Access	Yes	Yes
MESSAGE CENTER Pro/MESSAGE MANAGER Pro	***N/A***	***N/A***
MESSAGE CENTER (PC MC)	***N/A***	***N/A***
VIDEO CAPTURE	***N/A***	***N/A***
BUNDLED SOFTWARE (For Windows)		
Support OS Version	Win95/98(SE)/Me/NT4.0WS/2000Professional	No
Printer Driver	Yes (Brother)	No
Viewer	Yes (PaperPort by ScanSoft)	No
Pop Up Menu	Yes	No
TWAIN	Yes (Brother)	No
PC Fax	Yes (TX & RX by Brother)	No
BUNDLED SOFTWARE (For iMAC)		
Support OS Version	MacOS8.5-9.1	No
Others	MacOS8.6-9.1	No
Printer Driver	Yes (Brother)	No
Viewer	No	No
Pop Up Menu	No	No
TWAIN	Yes (Brother)	No
PC Fax	Yes (TX only by Brother)	No

*1: The figure is ideal, and refers only to the scanning period, but does not include the feeding & output time of document.

*2: By Brother#1 chart, it can store up to 600 pages.

Model Name	MFC-9760
MESSAGE CENTER/MESSAGE MANAGER	***N/A***
ICM Recording Time	-
Page Memory	-
OGM (MC;MC Pro;Paging;F/T)	-
TAD Type	-
Memo/Recording Conversation	-
Toll Saver	-
Fax Forwarding	-
Fax Retrieval	-
Paging	-
Remote Access	-
MESSAGE CENTER Pro/MESSAGE MANAGER Pro	***N/A***
MESSAGE CENTER (PC MC)	***N/A***
VIDEO CAPTURE	***N/A***
BUNDLED SOFTWARE (For Windows)	
Support OS Version	Win95/98(SE)/Me/NT4.0WS/2000Professional
Printer Driver	Yes (Brother)
Viewer	Yes (PaperPort by ScanSoft)
Pop Up Menu	Yes
TWAIN	Yes (Brother)
PC Fax	No
BUNDLED SOFTWARE (For iMAC)	
Support OS Version	MacOS8.5-9.1
Others	MacOS8.6-9.1
Printer Driver	Yes (Brother)
Viewer	No
Pop Up Menu	No
TWAIN	Yes (Brother)
PC Fax	No

*1: The figure is ideal, and refers only to the scanning period, but does not include the feeding & output time of document.

*2: By Brother#1 chart, it can store up to 600 pages.

CHAPTER II.

INSTALLATION

CHAPTER 2 INSTALLATION

CONTENTS

1. INSTALLING THE UPDATE DATA TO THE FACSIMILE MACHINE II-1

2. SETTING ID CODES TO FACSIMILE MACHINES II-3

1. INSTALLING THE UPDATE DATA TO THE FACSIMILE MACHINE

If you want to update the current program stored in the flash ROM of the main PCB to the newer version or after you replace the main PCB, install the update program onto the flash ROM.

The program installation requires a PC/AT-compatible computer (which is capable of running MS-DOS or its compatible OS).

Connecting the facsimile machine to your computer

(1) Make sure that your computer is turned off.

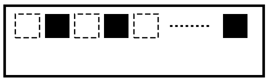
(2) Make sure that the machine's power cord is unplugged from a wall socket. (If the machine has a power ON/OFF switch, make sure that the switch is turned off.)

(3) Connect the parallel interface cable to the parallel port on the back of the machine and secure it with the lock wires.

(4) Connect the other end of the interface cable to the printer port of your computer and secure it with the two screws.

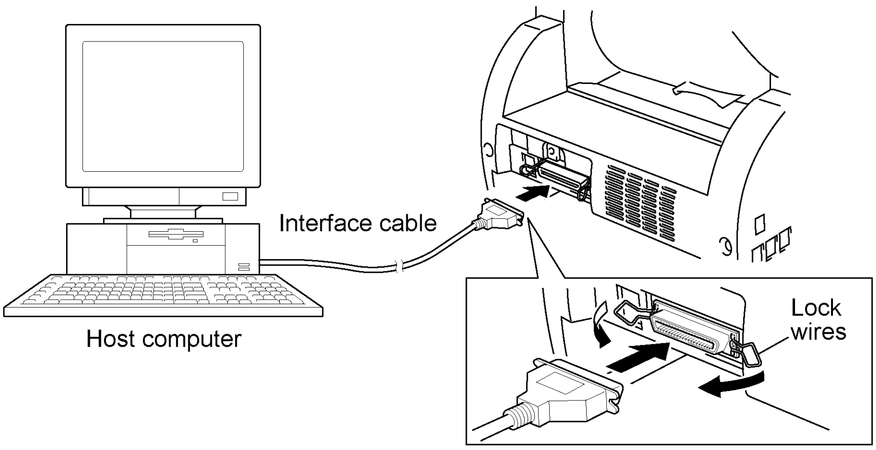
(5) While pressing the **5** key on the machine's control panel, plug the machine's power cord into a wall socket (or turn on the power ON/OFF switch if the machine has the switch).

(6) Check to see that the following pattern displays on the LCD. If it does not display, go back to step (2) above.



← 1st row
← 2nd row

(7) Turn on your computer.



Installing the update data onto the flash ROM of the facsimile machine

NOTE: The following is an installation procedure example on a PC that is running Windows 95/98.

(1) Copy the update data and transfer utility onto the desired directory of the hard disk.
e.g., C:\UPDATE

(2) Click the Start button, point to Programs, and then click MS-DOS Prompt to open an MS-DOS window.

(3) Type the drive letter where the update data and transfer utility are located. In the above example, type C:\ from the command line and press the **ENTER** key.

Then type CD UPDATE and press the **ENTER** key.

(4) Check that your computer is connected with the facsimile machine correctly.

(5) To start the transfer utility transmitting the update data to the flash ROM of the facsimile machine, type the following:

`ICEN` *`filename`* `/b`

Where *`filename`* is an update data file, e.g., 9800x.upd.

Then press the **ENTER** key.

During downloading, the machine beeps *intermittently*.

Upon completion of the downloading, the machine beeps *continuously*.

NOTE: If the facsimile machine cannot return to the standby state after completion of downloading, turn the power off and on.

2. SETTING ID CODES TO FACSIMILE MACHINES

Brother facsimile machines are assigned unique ID codes (character strings) at the factory. If you replace the main PCB of the machine, the machine will lose its assigned ID code so that it will not be identified by the connected PC*.

You need to assign a unique ID code (character string) to the machine according to the procedure given here. For models covered by this manual, set serial numbers given to individual machines as ID codes.

(*ID codes are essential when more than one machine is connected to a single PC via USB.)

Connecting the facsimile machine to your PC (See the illustration on page II-1.)

(1) Make sure that your PC is turned off.

(2) Make sure that the machine's power cord is unplugged from a wall socket or other power source.

(3) Connect the interface cable to the parallel interface port on the back of the facsimile machine and secure it with the lock wires.

(4) Connect the other end of the interface cable to the printer port of your PC and secure it with the two screws.

(5) Plug the machine's power cord into a wall socket or other power source.

(6) Turn on your PC.

Operating procedure

(1) On your PC, run the ID setting utility. Follow the instructions shown on the PC's screen and enter the 9-digit serial number (e.g., G01012345) printed on the nameplate labeled to the back of the facsimile machine as an ID code. Then press the Enter key.

The ID setting utility will transmit the ID code data from your PC to the facsimile machine and then it will terminate.

The facsimile machine will automatically return to the standby mode.

(2) To check whether the entered character string (ID code) is correct, make the machine enter the maintenance mode (refer to CHAPTER V, Section 1) and then press the **1** key twice (Subsection 3.5).

The facsimile machine will print out a Configuration List. At the right top of the list, "SER.#: BROXXXXXXXXX" is printed.

(3) Check that the character string entered in step (2) is printed in "XXXXXXXXX."

If it is OK, press the **9** key twice to exit from the maintenance mode.

If something other than that is printed in XXXXXXXXX, check the connection between the PC and facsimile machine and go back to step (1).

CHAPTER III.

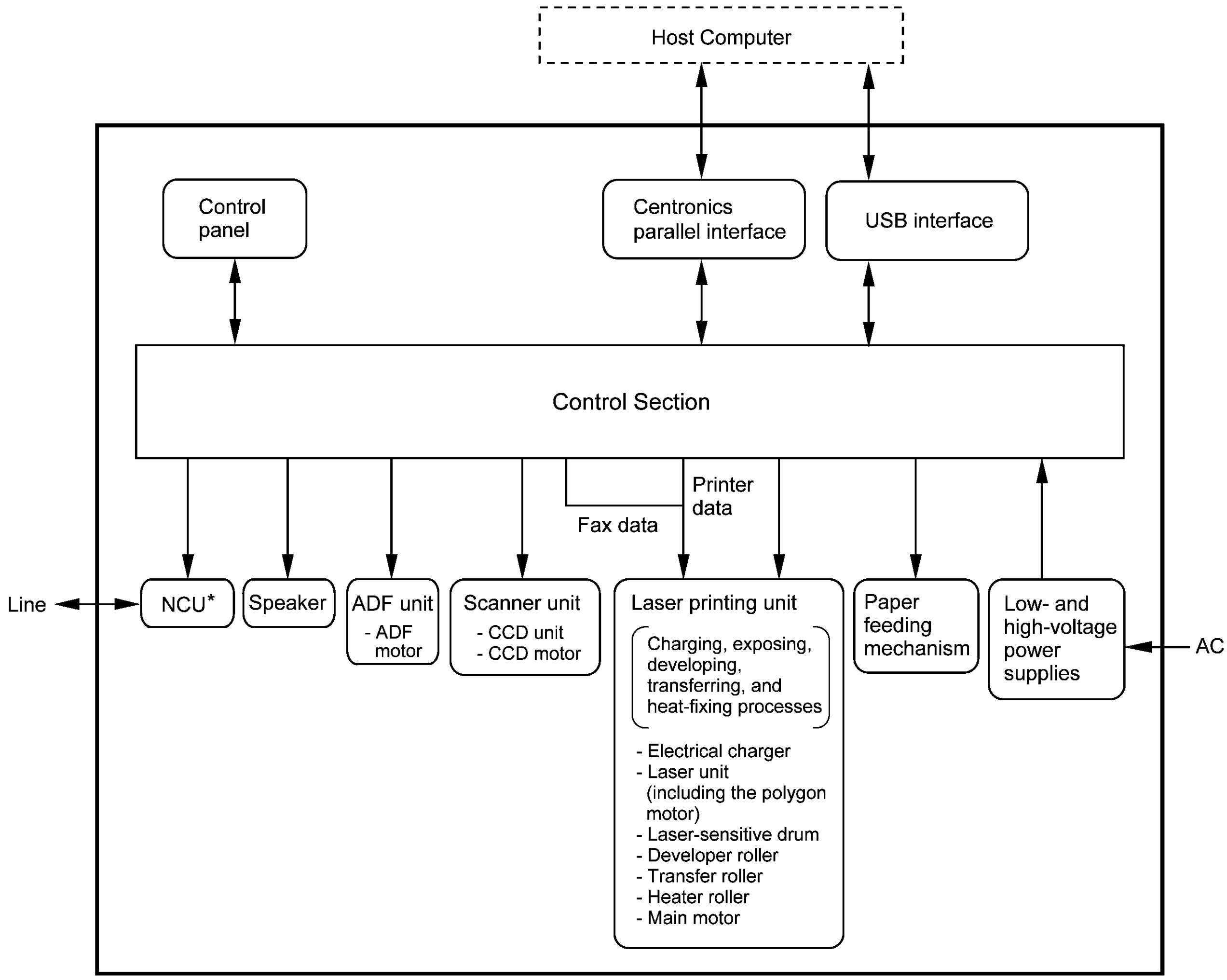
THEORY OF OPERATION

CHAPTER III. THEORY OF OPERATION

CONTENTS

1. OVERVIEW III-1
2. MECHANISMS III-2
   2.1 Scanner Mechanism.. III-3
   2.2 Laser Printing Mechanism.. III-5
      2.2.1 Paper pick-up and registration mechanism III-5
      2.2.2 Print process mechanism.. III-6
      2.2.3 Heat-fixing mechanism III-8
      2.2.4 Paper ejecting mechanism.. III-9
   2.3 Sensors and Actuators III-10
3. CONTROL ELECTRONICS.. III-13

1. OVERVIEW

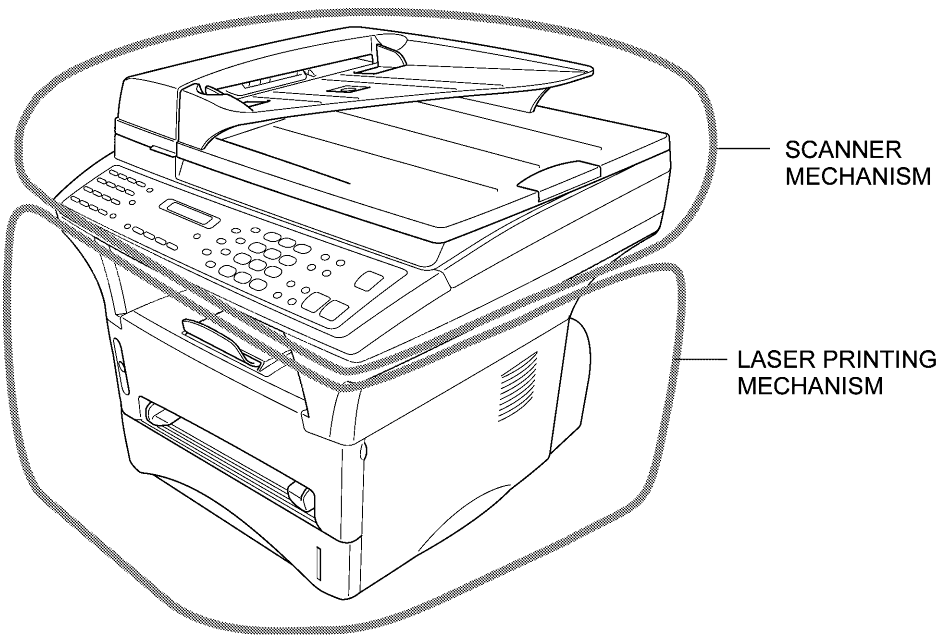


* Provided on models supporting facsimile function.

2. MECHANISMS

The machine is classified into the following mechanisms:

- SCANNER MECHANISM
  - ADF mechanism
  - Document scanning mechanism
- LASER PRINTING MECHANISM
  - Paper pick-up and registration mechanism
  - Print process mechanism (consisting of charging, exposing, developing, and transferring processes) with paper feeding mechanism
  - Heat-fixing mechanism with paper feeding mechanism
  - Paper ejecting mechanism
- SENSORS AND ACTUATORS

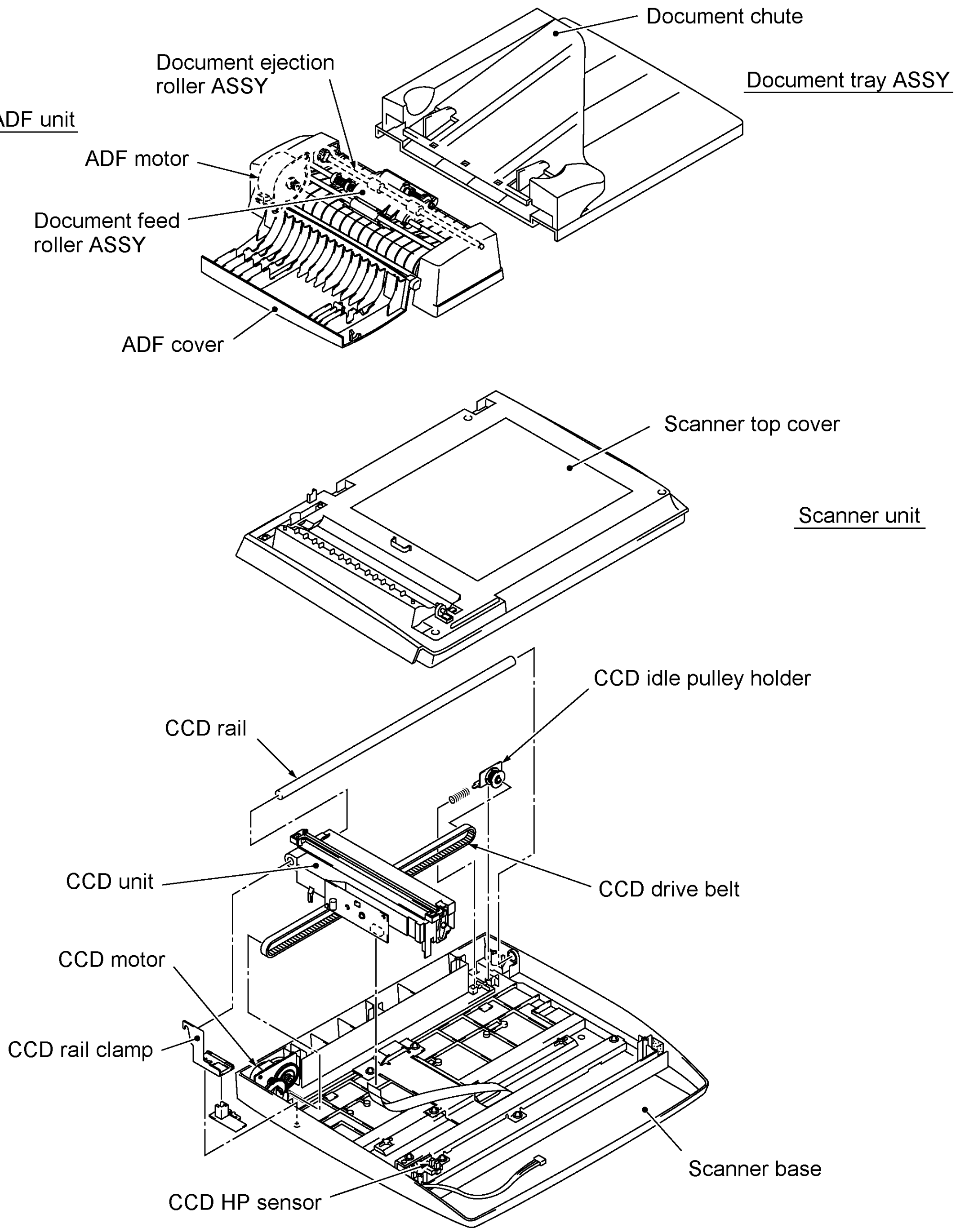


2.1 Scanner Mechanism

This mechanism consists of the following:

- document tray ASSY which consists of a document chute and document tray,
- automatic document feeder (ADF) unit which consists of a document feed roller ASSY, document ejection roller ASSY, ADF motor, and document front and rear sensors, and
- scanner unit which consists of a scanner top cover, CCD unit, CCD drive mechanism, CCD HP sensor, and scanner base.

For details about the sensors, refer to Section 2.3.



This scanner mechanism supports a dual scanning system.

(1) If you set documents with their faces up on the document chute and start the scanning operation, the ADF motor rotates so that the document feed roller ASSY feeds those documents into the ADF unit, starting from the top sheet to the bottom, page by page. Each document curves downwards and turns to the right so as to advance above the CCD unit, and then it is fed out to the document tray with the document ejection roller ASSY.

    This way, documents move above the CCD unit being kept in a stationary position.

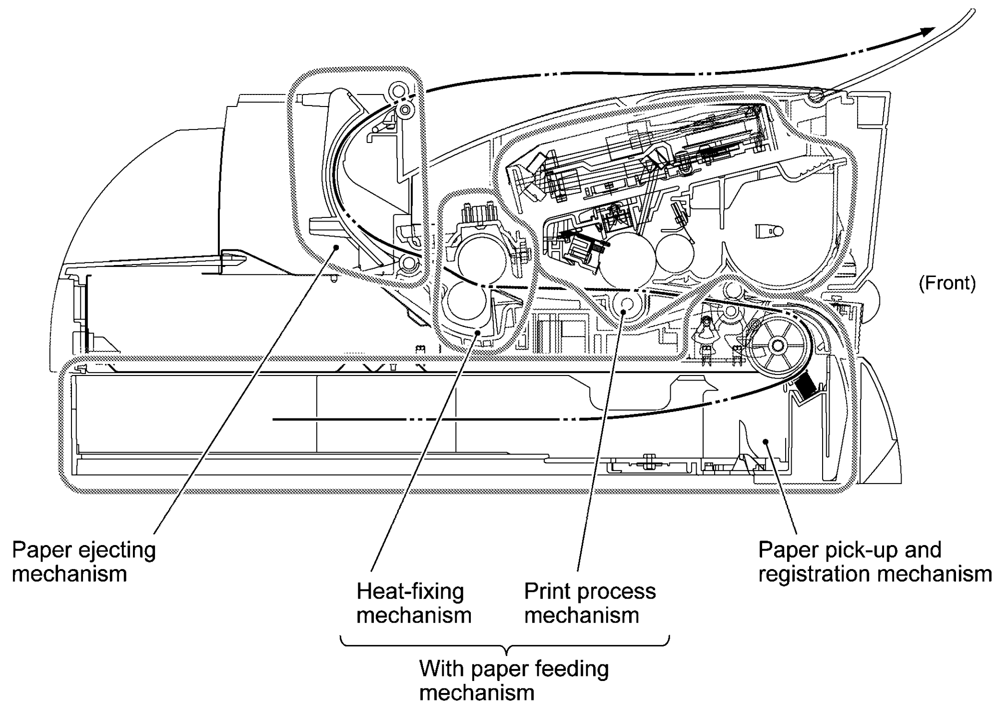
(2) If you open the scanner unit, put a sheet of document (or put a bound book opened) on the glass of the scanner top cover, close the scanner unit, and start the scanning operation, then the CCD drive mechanism will be driven. That is, the CCD motor rotates and its rotation will be transmitted via the gear train to the CCD drive belt.

    The CCD unit, which is supported and guided by the CCD rail, is secured to the CCD drive belt. Clockwise and counterclockwise rotations of the CCD motor move the CCD unit to the right and left, respectively.

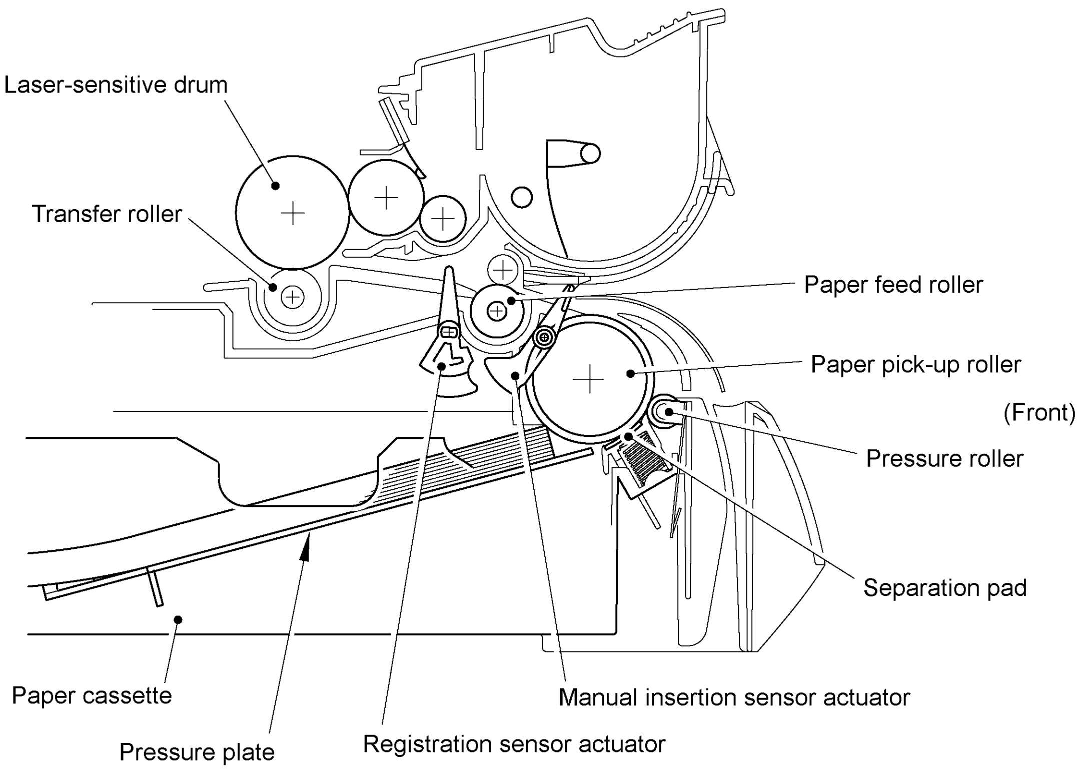
    In this scanning system, the CCD unit moves horizontally beneath a document being kept in stationary position.

The CCD unit contains a charge coupled device (CCD) image sensor. The cold-cathode fluorescent lamp illuminates a document and the reflected light of the scanned image data is transmitted via the mirrors into the lens which reduces the scanned data so as to form the image on the CCD.

2.2 Laser Printing Mechanism



2.2.1 Paper pick-up and registration mechanism



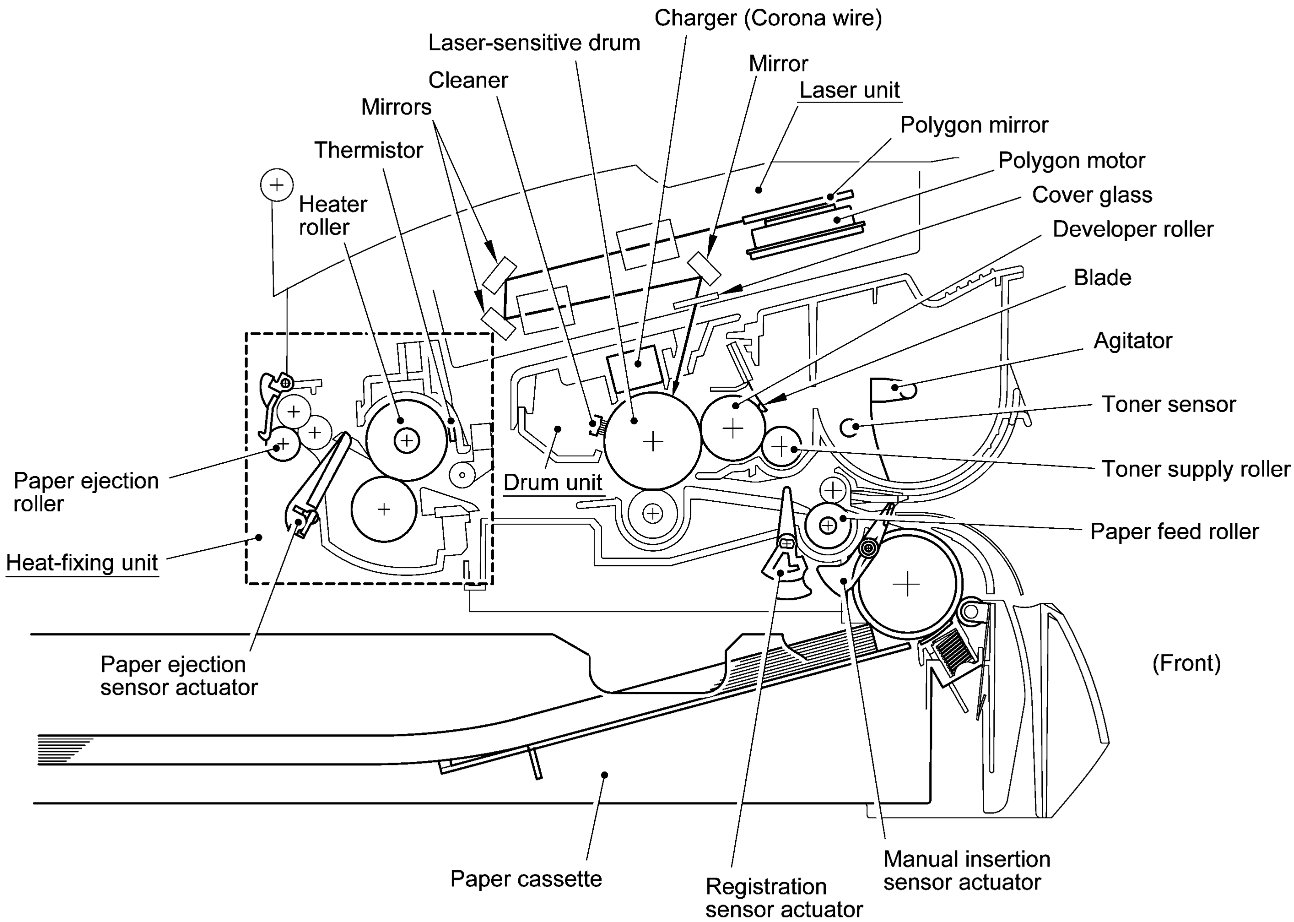
At the 1st stage, the controller drives the main motor without energizing the solenoid so that the paper feed roller simply idles.

At the 2nd stage, the controller energizes the solenoid so that the paper feed roller no longer rotates and the paper pick-up roller starts rotating to pick up paper into the machine, a sheet at a time. After the leading edge of the pulled-in paper passes through the manual insertion sensor actuator, the paper is further fed for the specified time length. Accordingly, the leading edge will reach the paper feed roller where the paper skew will be eliminated.

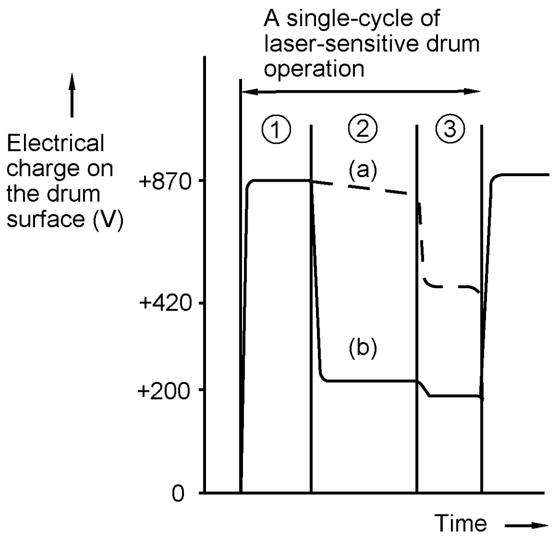
At the 3rd stage, the controller deenergizes the solenoid to rotate the paper feed roller for feeding paper to the transfer block in the drum unit.

When the leading and trailing edges of the paper pass through the registration sensor actuator, the sensor signals them to the controller. According to those signals, the controller may determine the first print position on the paper.

2.2.2 Print process mechanism



The print process unit works with laser beam, electrical charges, and toner. The graph below shows the transition of electrical charge on the surface of the laser-sensitive drum through the four processes: charging, exposing, developing, and transferring processes.



① Charges the drum surface positively.

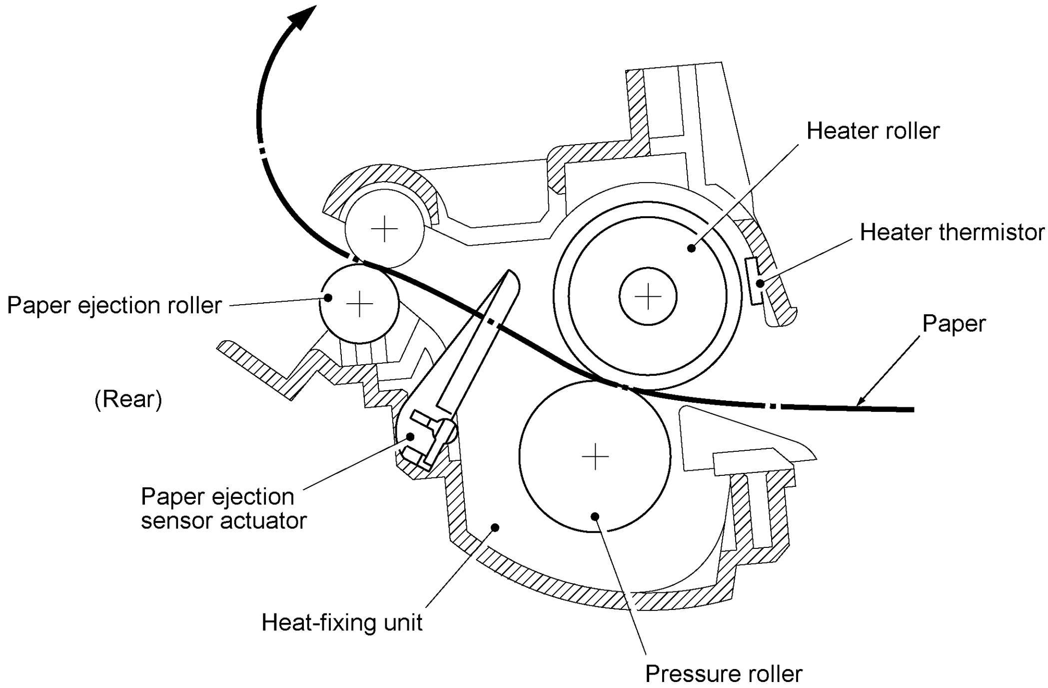
② Exposes the drum surface to a laser beam to form a latent image and develops the latent image with toner.

(a) Unexposed area (Non-image area)

(b) Exposed area (Image area)

③ Transfers the toner-formed image from the drum to paper.

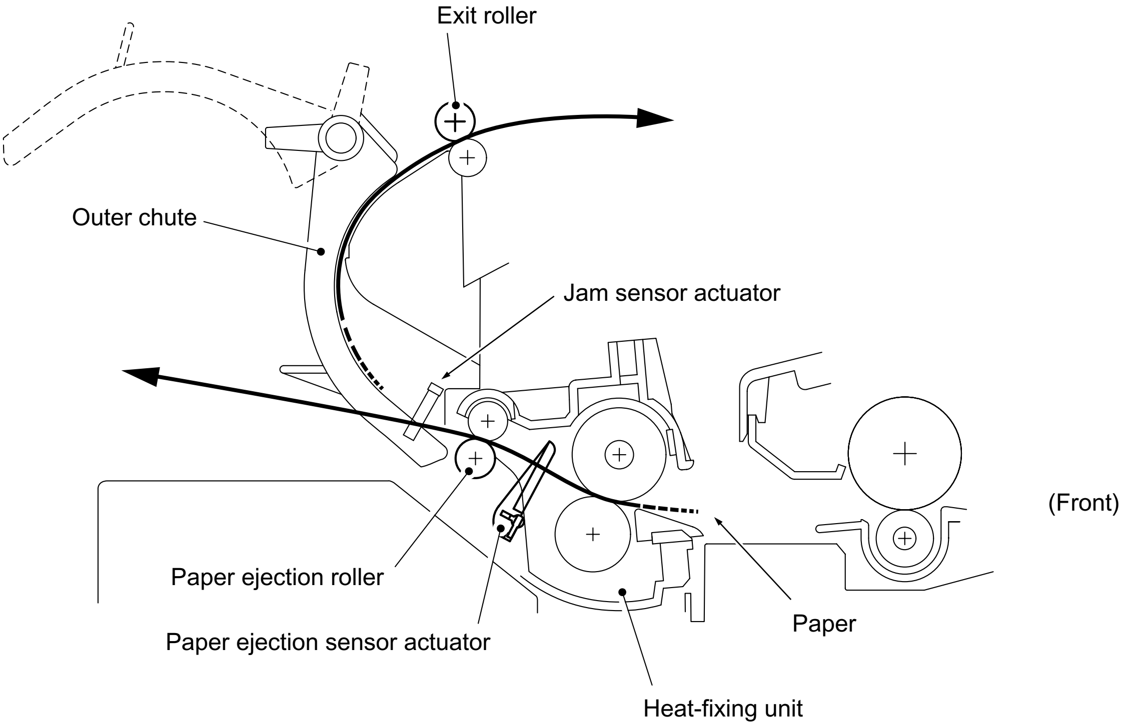
2.2.3 Heat-fixing mechanism



As the paper passes between the heater roller and the pressure roller in the heat-fixing unit, the heater roller fuses the toner on the paper.

The controller monitors the internal resistance of the heater thermistor to keep the surface temperature of the heater roller constant by turning the halogen heater lamp on and off.

2.2.4 Paper ejecting mechanism



After the paper passes through the heat-fixing process, it will be ejected from the heat-fixing unit by the paper ejection roller.

If the leading edge of the paper pushes down the actuator of the paper ejection sensor, the sensor signals the start of paper ejection. If the trailing edge has passed through the sensor actuator, the sensor signals the completion of paper ejection.

If the jam sensor actuator will not be pushed up within the specified period after the leading edge of the paper pushes down the paper ejection sensor actuator, then the controller will interpret such an event as a paper jam inside the heat-fixing unit and display a jam error on the LCD.

The paper will be turned over along the outer chute and ejected onto the main cover by the exit roller.

2.3 Sensors and Actuators

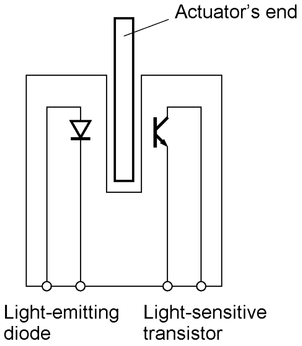
This machine has 13 sensors: 10 photosensors*, two thermistors, and a mechanical switch as described below.

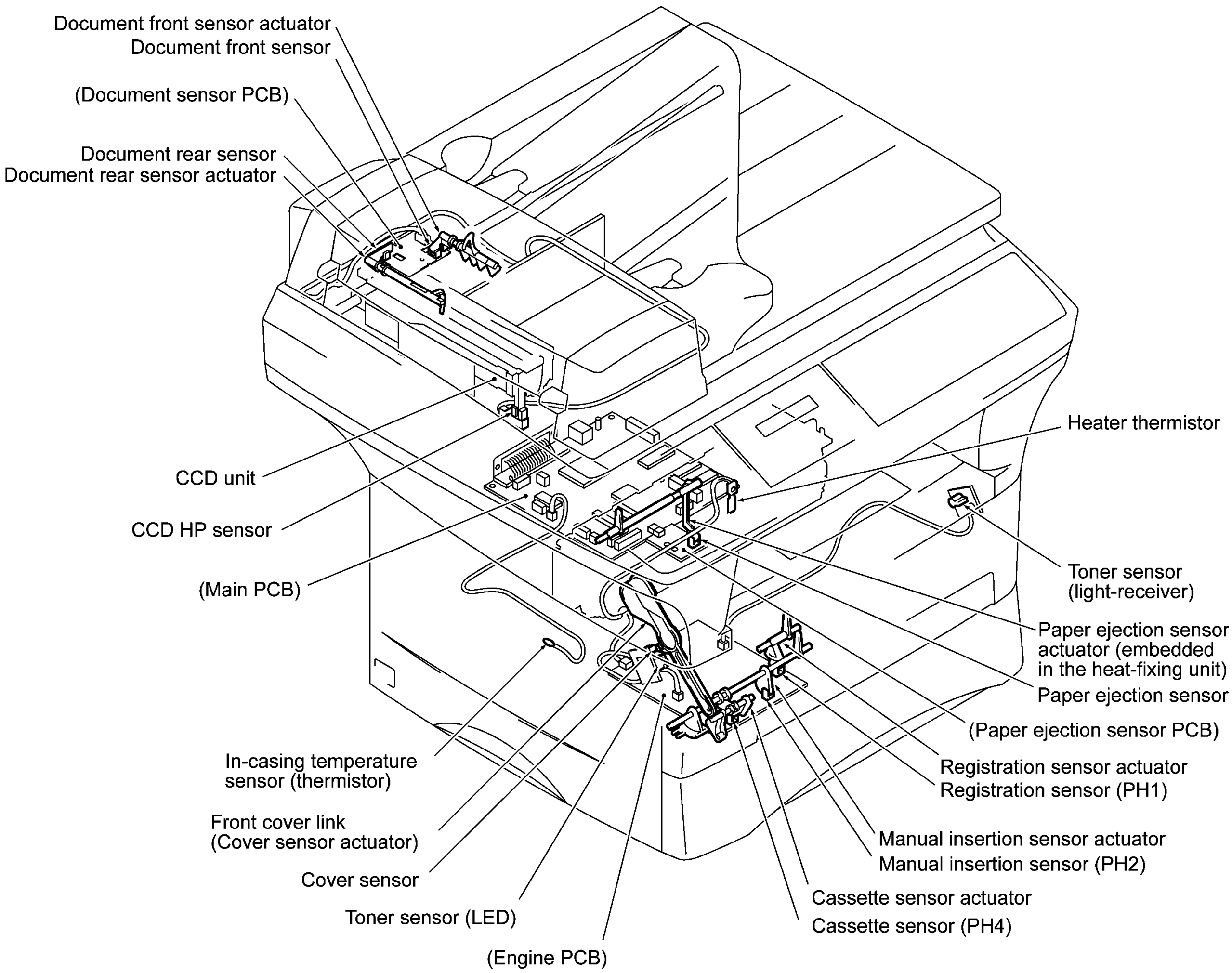
(*Models supporting a 2nd paper cassette have two more photosensors--2nd registration sensor and 2nd cassette sensor.)

Sensor name	Type	Located on
Document front sensor	Photosensor	Document sensor PCB
Document rear sensor	Photosensor	Document sensor PCB
Document tray open sensor	Mechanical switch	Harness support
CCD HP sensor	Photosensor	CCD unit
Manual insertion sensor	Photosensor	Engine PCB
Registration sensor	Photosensor	Engine PCB
Cassette sensor	Photosensor	Engine PCB
Paper ejection sensor	Photosensor	Paper ejection sensor PCB
Toner sensor	Photosensor	Toner sensor (LED) PCB and toner sensor (light-receiver) PCB
Cover sensor	Photosensor	Toner sensor (LED) PCB
Jam sensor	Photosensor	Heat-fixing unit
Heater thermistor	Thermistor	Heat-fixing unit
In-casing temperature sensor	Thermistor	Left-hand plate of the main chassis

- Document front sensor which detects the presence of documents.
- Document rear sensor which detects the leading and trailing edges of pages to tell the control circuitry when the leading edge of a new page has reached the starting position and when the scan for that page is over.
- Document tray open sensor which detects whether the document tray is closed.
- CCD HP sensor which detects whether the CCD unit is placed in the home position.
- Manual insertion sensor which detects whether paper is inserted manually through the paper slot or whether paper fed through the paper cassette has jammed.
- Registration sensor which detects the leading and trailing edges of recording paper, which allows the controller to determine the registration timing and check paper jam.
- Cassette sensor which detects whether the paper cassette is loaded.
- Paper ejection sensor which detects whether the recording paper goes out of the machine.
- Toner sensor which detects whether there is toner or a toner cartridge is loaded.
- Cover sensor which detects whether the front cover is closed.
- Jam sensor which detects whether paper is jammed inside the heat-fixing unit.
- Heater thermistor which allows the controller to monitor the temperature of the heater roller of the fixing unit.
- In-casing temperature sensor which allows the controller to monitor the temperature inside the machine.

The above photosensors are a photo-interrupter consisting of a light-emitting diode and a light-sensitive transistor. Each of them has an actuator separately arranged as shown on the next page.





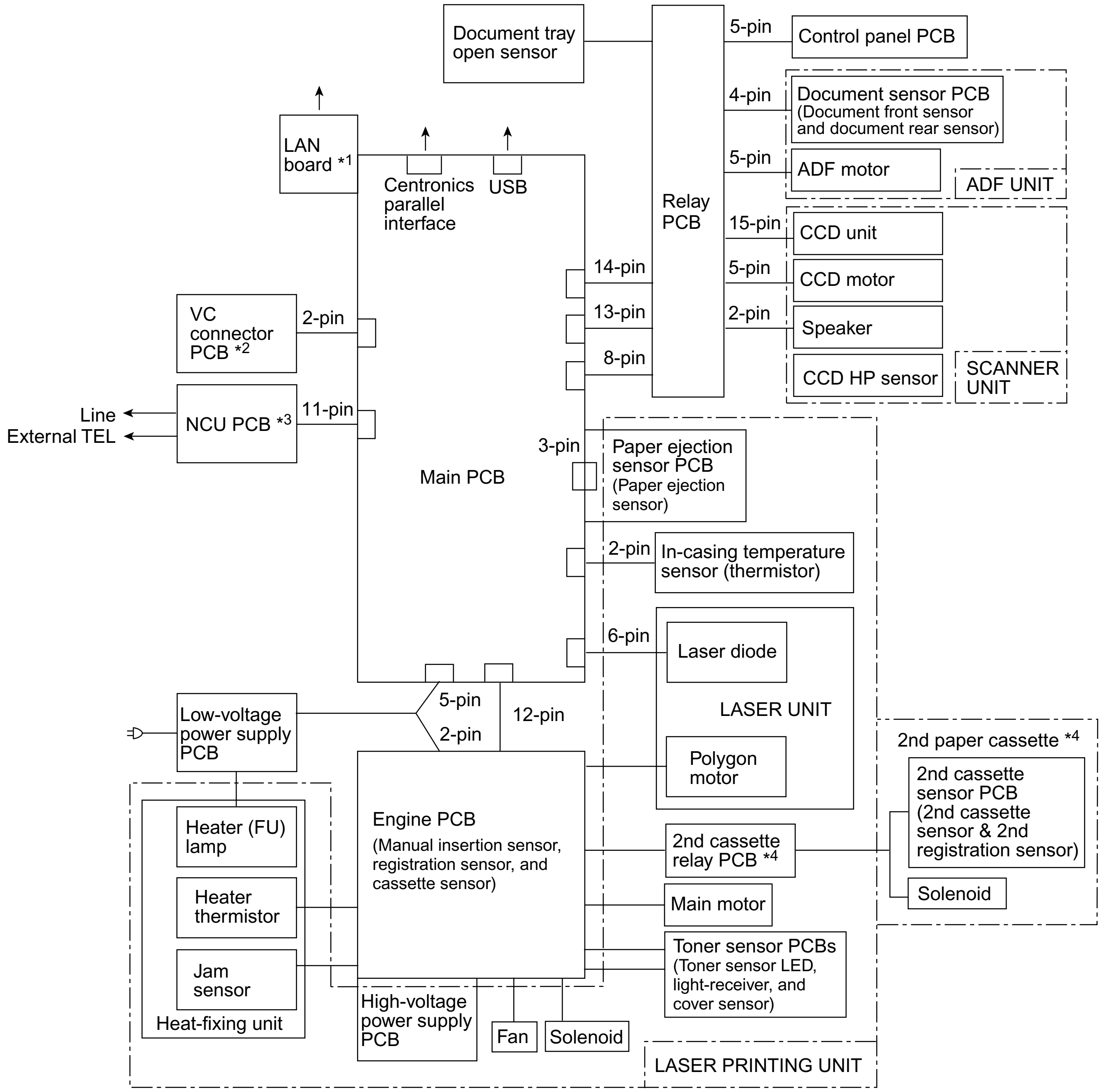
NOTE: Document tray open sensor and jam sensor

The machine has a document tray open sensor and jam sensor (both of which are not shown in the above illustration). The former is on the harness support; the latter is on the heat-fixing unit.

Location of Sensors and Actuators

3. CONTROL ELECTRONICS

The hardware configuration of the machine is shown below.



*1 Provided on models supporting LAN interface.
*2 Models supporting the video capture are not available now.
*3 Provided on models supporting facsimile function.
*4 Provided on models available with a 2nd paper cassette (as an option).

Configuration of Machine

CHAPTER IV.

DISASSEMBLY/REASSEMBLY AND LUBRICATION

CHAPTER IV. DISASSEMBLY/REASSEMBLY AND LUBRICATION

CONTENTS

1. DISASSEMBLY/REASSEMBLY IV-1
- Safety Precautions IV-1
- Preparation IV-2
- How to Access the Object Component IV-2
- Disassembly Order Flow IV-3

1.1 Lower Rear Cover IV-4
1.2 Access Plates R and F IV-4
1.3 Paper Cassette IV-5
1.4 Document Tray ASSY IV-6
1.5 Upper Rear Cover IV-8
1.6 ADF Unit and Document Tray Open Sensor IV-9
[Disassembling the ADF Unit] IV-11
1.7 Scanner Unit and Control Panel ASSY IV-16
[Disassembling the Scanner Unit] IV-19
[Disassembling the Control Panel ASSY] IV-24
1.8 Relay PCB IV-25
1.9 Speaker IV-26
1.10 Scanner Mount IV-27
1.11 Paper Sub Tray and Tray Holder IV-30
1.12 VC Cover, VC Bracket, and VC Connector PCB (for models supporting video capture) IV-31
1.13 Front Cover
Front Sub Cover (for models not supporting video capture) IV-32
1.14 Outer Chute and Paper Pinch Rollers IV-33
1.15 Main Cover IV-34
1.16 Switch Cover (for models not equipped with a power switch) IV-35
1.17 Laser Unit IV-36
1.18 Heat-fixing Unit and FU Lamp IV-37
1.19 Fan IV-51
1.20 Drive Gear ASSY and Main Motor ASSY IV-53
1.21 NCU Shield and NCU PCB* IV-55
1.22 Bottom Plate, Main PCB, and Bottom Insulation Film IV-57
1.23 Low-voltage Power Supply PCB and Power Inlet IV-61

1.24 Inner Insulation Film, High-voltage Power Supply PCB, Engine PCB, and 2nd Cassette Relay PCB* IV-63
1.25 Toner Sensor (light-receiver) PCB and Toner Sensor (LED) PCB IV-65
1.26 Gears and Paper Pick-up Roller IV-66
1.27 Paper Feed Roller ASSY IV-67
1.28 Clutch Levers, Cassette Guide L, and Solenoid IV-68
1.29 Cleaning of High-voltage Contacts and Grounding Contacts IV-69

2. LUBRICATION IV-71

[1] ADF unit IV-71
[2] Scanner mount IV-72
[3] Drive gear ASSY IV-73
[4] Paper cassette IV-74

1. DISASSEMBLY/REASSEMBLY

■ Safety Precautions

To prevent the creation of secondary problems by mishandling, observe the following precautions during maintenance work.

(1) Unplug the power cord from the power outlet before accessing parts or units inside the machine. When having access to the power supply, be sure to unplug the power cord from the power outlet.

(2) When servicing the optical system of the laser printing unit, be careful not to place screwdrivers or other reflective objects in the path of the laser beam. Be sure to take off any personal accessories such as wrist watches and rings before working on the printer. A reflected beam, though invisible, can permanently damage your eyes.

(3) If the machine has been printing, allow the heat-fixing unit (inside this unit is a heater roller) sufficient time to cool down before starting maintenance jobs. It is HOT!

(4) Be careful not to lose screws, washers, or other parts removed for parts replacement.

(5) Do not remove gears from the document feed roller ASSY or document ejection roller ASSY if at all possible. Once removed, they will become unusable and new gears will have to be put back in.

(6) When using soldering irons and other heat-generating tools, take care not to damage the resin parts such as wires, PCBs, and covers.

(7) Before handling the PCBs, touch a metal portion of the machine to discharge static electricity; otherwise, the electronic parts may be damaged due to the electricity charged in your body.

(8) When transporting PCBs, be sure to wrap them in conductive sheets such as aluminum foil.

(9) Be sure to reinsert self-tapping screws correctly, if removed. Unless otherwise specified, tighten screws to the following torque values:

Taptite, bind B and cup B	M3: M4:	0.7 N•m 0.8 N•m
Taptite, cup S	M3:	0.8 N•m
Other screws	M3: M4:	0.7 N•m 0.8 N•m

(10) When connecting or disconnecting cable connectors, hold the connector bodies not the cables. If the connector has a lock, always slide the connector lock to unlock it.

(11) Before reassembly, apply the specified lubricant to the specified points. (Refer to Section 2 in this chapter.)

(12) After repairs, check not only the repaired portion but also that the connectors and other related portions function properly before operation checks.

■ Preparation

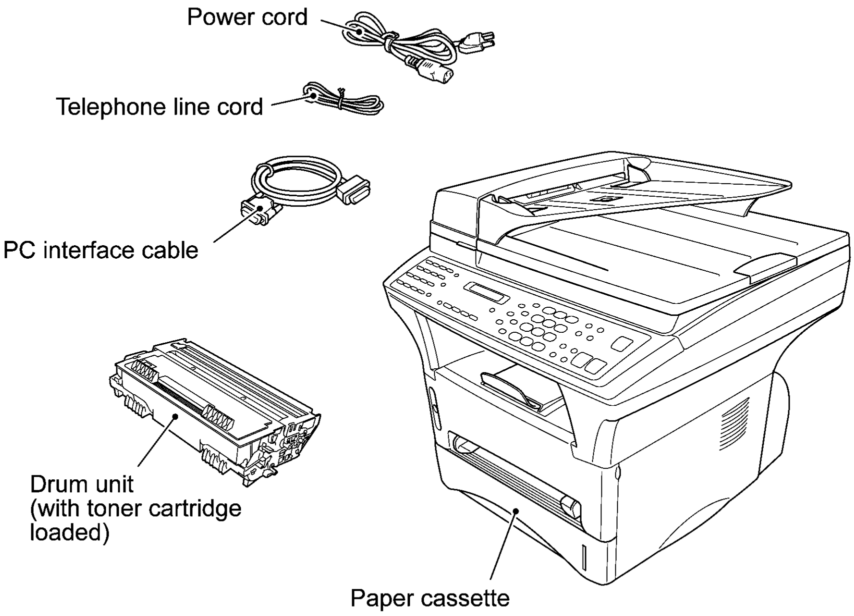
Prior to proceeding to the disassembly procedure,

(1) Unplug

- the power cord,
- the modular jack of the telephone line,
- the PC interface cable, and
- the modular jack of an external telephone set if connected. (Not shown below.)

(2) Remove

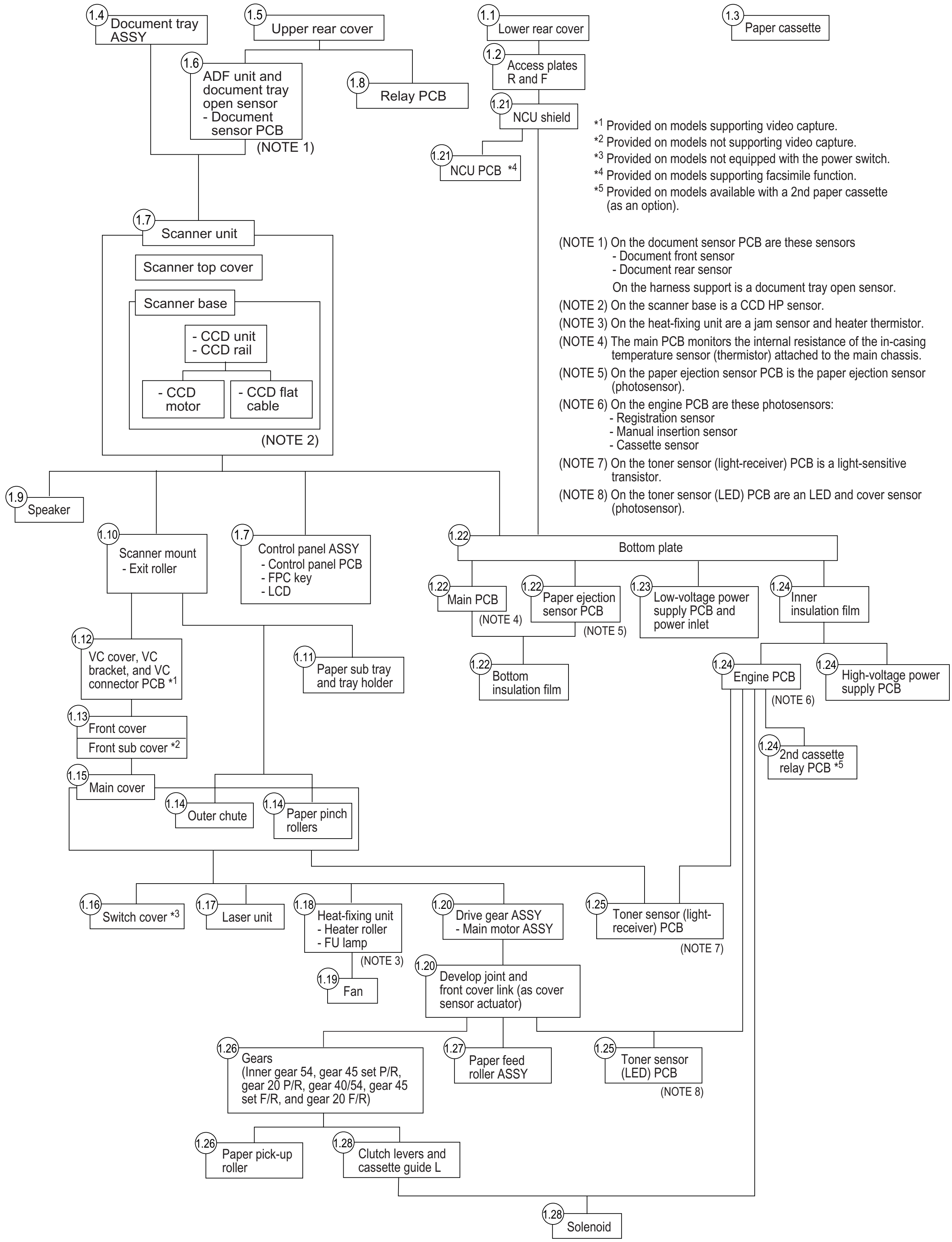
- the paper cassette and
- the drum unit (with toner cartridge loaded).



■ How to Access the Object Component

- On the next page is a disassembly order flow which helps you access the object components. To remove the heat-fixing unit, for example, first find it on the flow and learn its number (1.18 in this case). You need to remove parts numbered 1.4, 1.5, 1.6, 1.7, 1.10, 1.12, 1.13, and 1.15 so as to access the heat-fixing unit.
- Unless otherwise specified, the disassembled parts or components should be reassembled in the reverse order of removal.

■ Disassembly Order Flow



*1 Provided on models supporting video capture.
*2 Provided on models not supporting video capture.
*3 Provided on models not equipped with the power switch.
*4 Provided on models supporting facsimile function.
*5 Provided on models available with a 2nd paper cassette (as an option).

(NOTE 1) On the document sensor PCB are these sensors
- Document front sensor
- Document rear sensor

On the harness support is a document tray open sensor.

(NOTE 2) On the scanner base is a CCD HP sensor.

(NOTE 3) On the heat-fixing unit are a jam sensor and heater thermistor.

(NOTE 4) The main PCB monitors the internal resistance of the in-casing temperature sensor (thermistor) attached to the main chassis.

(NOTE 5) On the paper ejection sensor PCB is the paper ejection sensor (photosensor).

(NOTE 6) On the engine PCB are these photosensors:
- Registration sensor
- Manual insertion sensor
- Cassette sensor

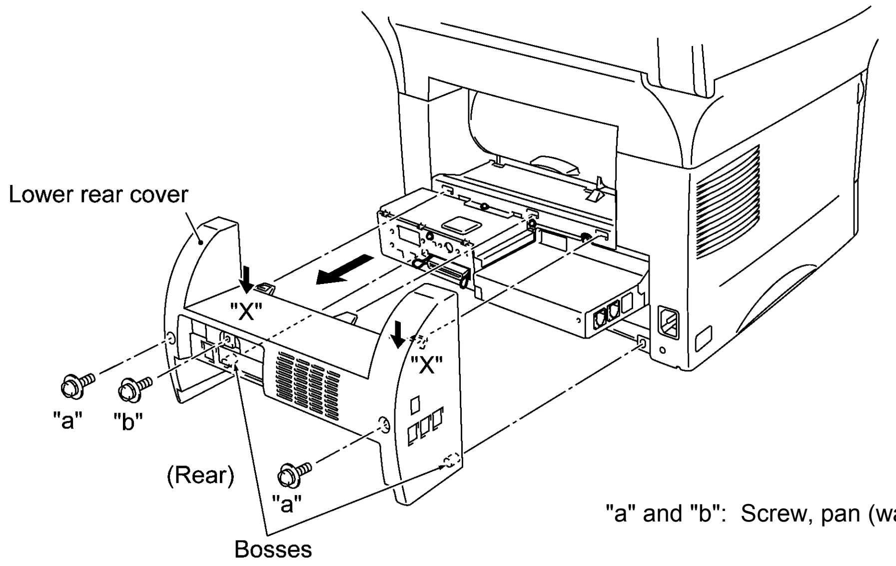
(NOTE 7) On the toner sensor (light-receiver) PCB is a light-sensitive transistor.

(NOTE 8) On the toner sensor (LED) PCB are an LED and cover sensor (photosensor).

1.1 Lower Rear Cover

(1) Remove the three screws (two "a" and one "b") from the lower rear cover. Screw "b" is provided on those models available with a 2nd paper cassette (as an option).

(2) Lightly pressing sections "X," pull out the lower rear cover.



"a" and "b": Screw, pan (washer) M4x10DB

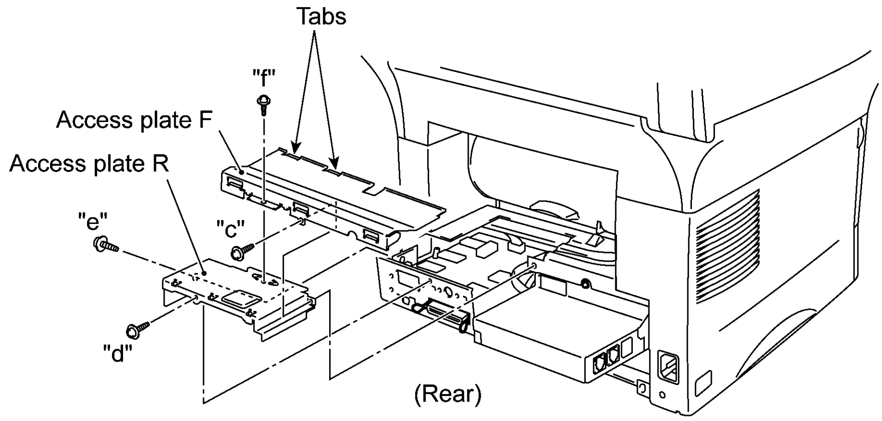
1.2 Access Plates R and F

(1) Remove screw "c" that secures access plates R and F together to the main chassis.

(2) Remove screws "d" and "e" from access plate R.

(3) Take out access plates R and F together.

(4) Remove screw "f" to separate those access plates.



"c" to "f": Taptite, cup S M3x6
(Tightening torque: 0.5 N•m)

■ **Reassembling Notes**

- When reinstalling access plate F, fit the two tabs provided on the front end underneath the center edge of the main chassis.

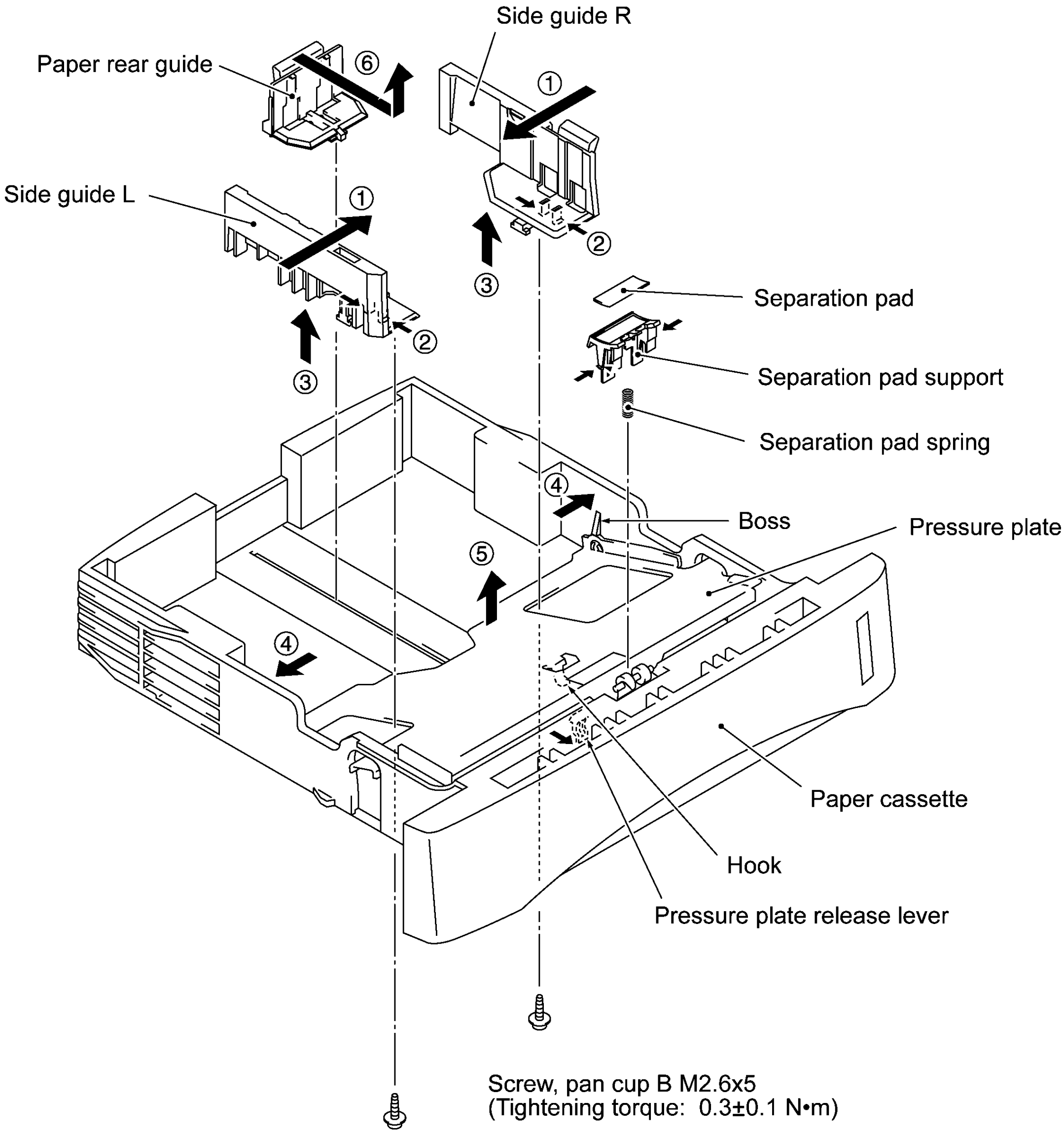
1.3 Paper Cassette

(1) Pull the pressure plate release lever to the front to release the pressure plate.

(2) Fully slide the side guide (R or L) inwards (in the direction of arrow ①) and remove the screw. Then release the latches (arrow ②) and pull up the side guide (arrow ③).

(3) Release the pressure plate from the bosses (arrow ④) and remove it (arrow ⑤).

(4) Fully slide the paper rear guide to the front and lift it up (arrow ⑥).

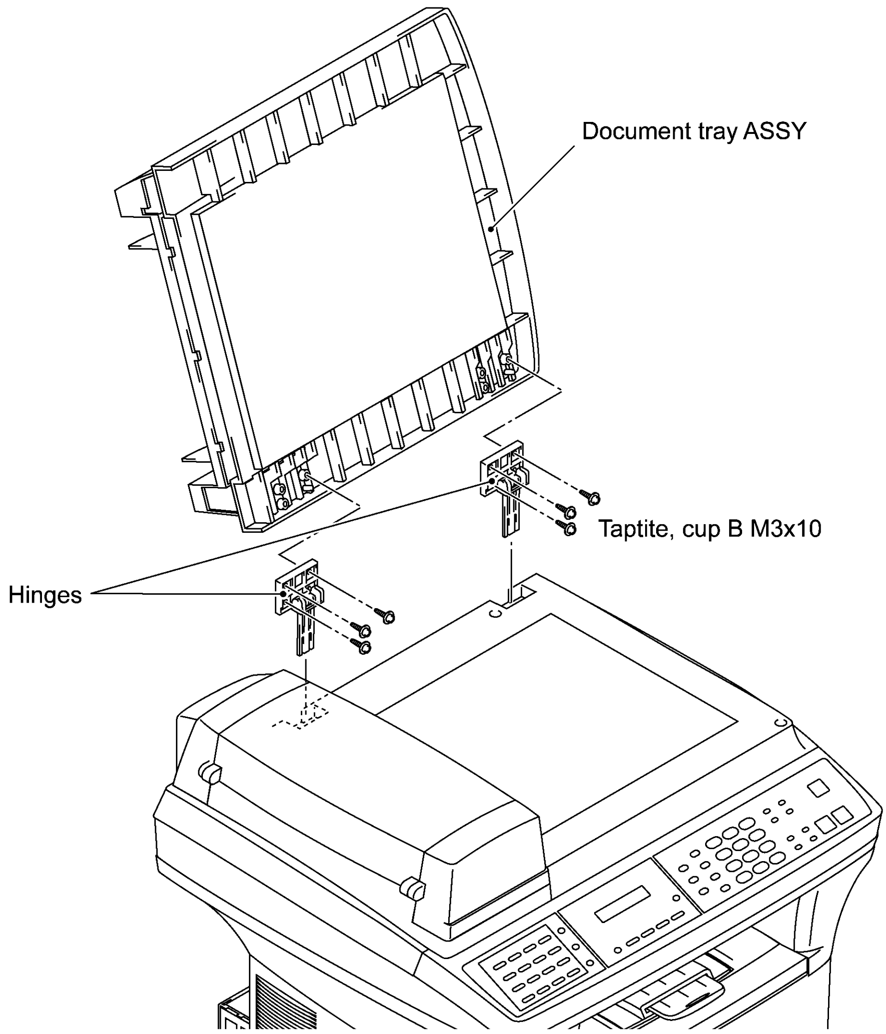


1.4 Document Tray ASSY

(1) Fully open the document tray ASSY.

(2) Lift up the document tray ASSY straight and pull the hinges up and out of the scanner unit.

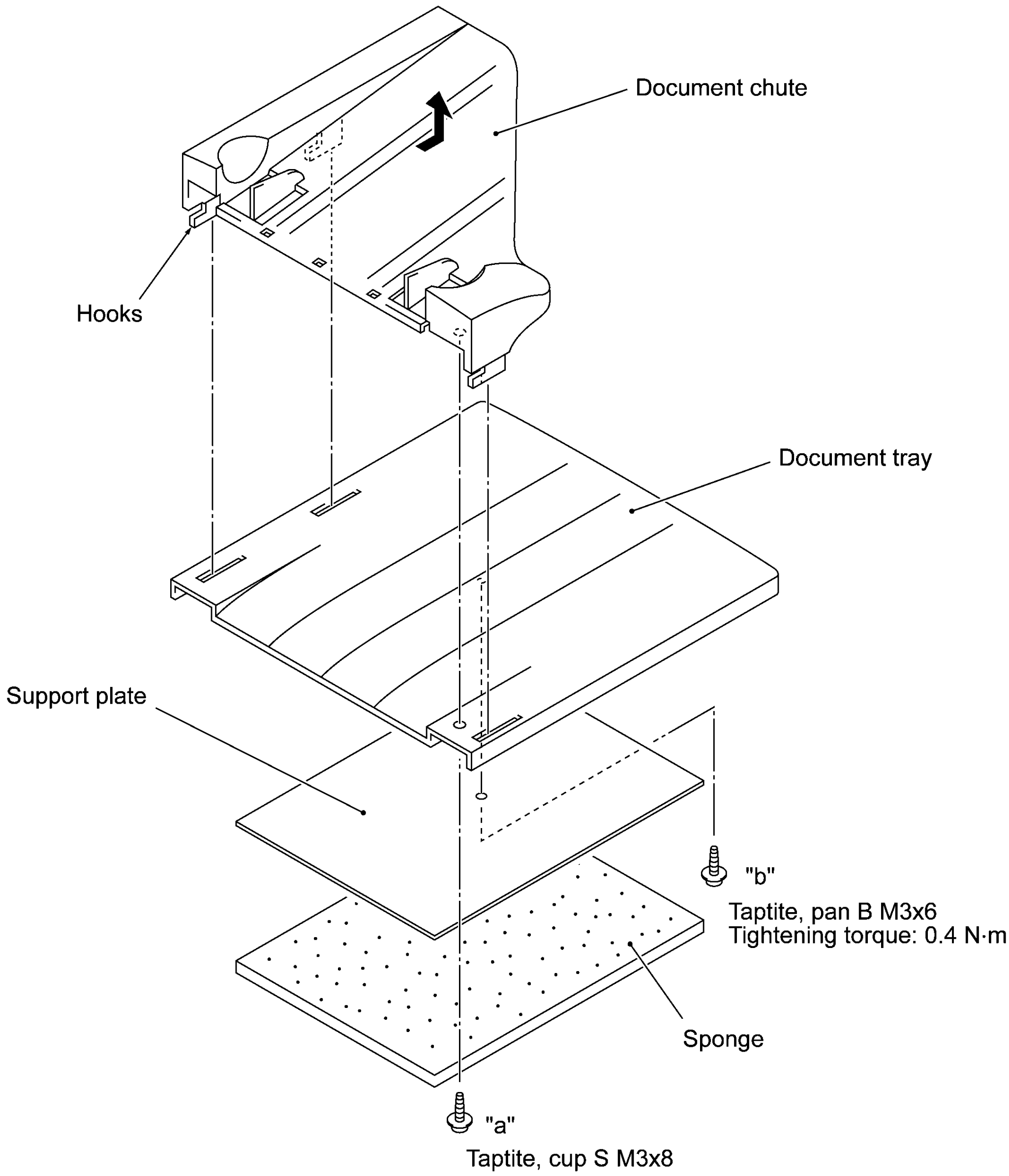
(3) Remove the three screws from each of the hinges.



(4) Remove screw "a," then lightly tap the left end of the document chute to release the three hooks from the document tray.

(5) Remove the sponge.

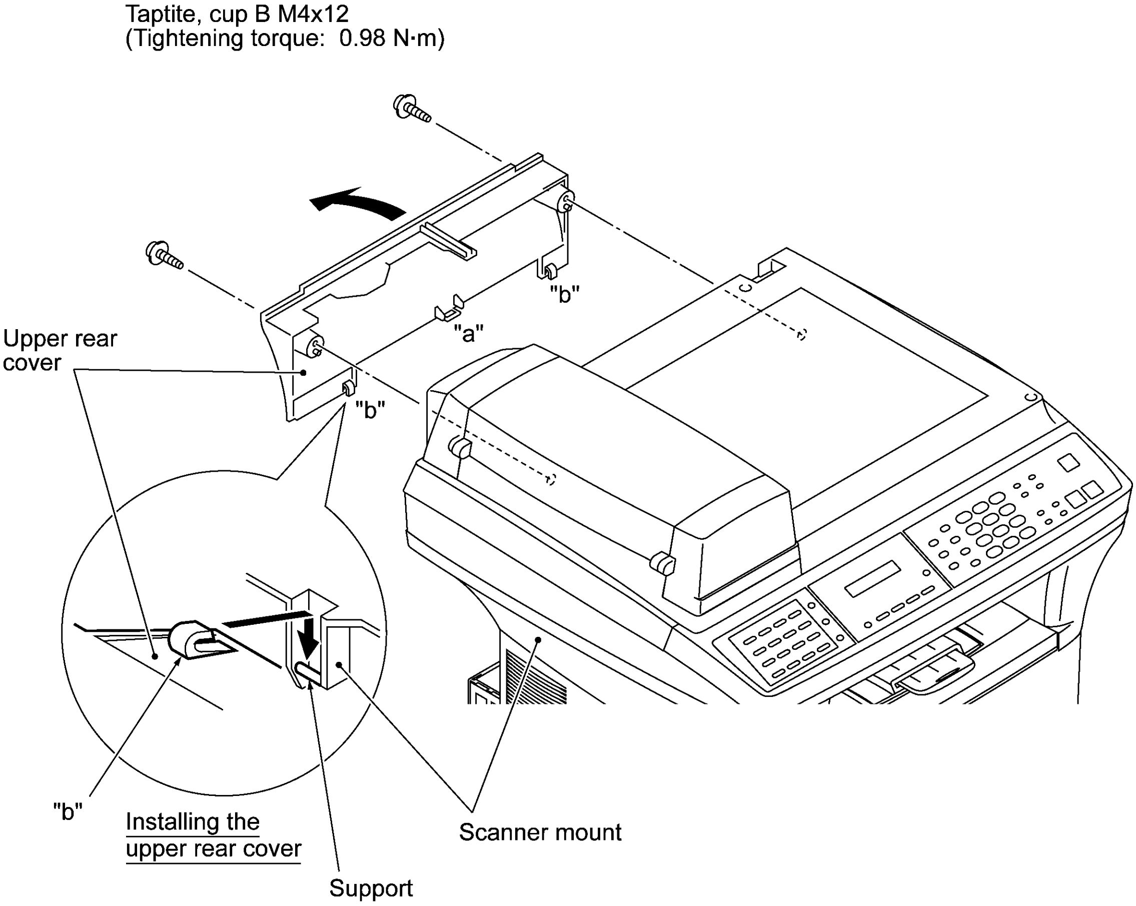
(6) Remove screw "b" to take off the support plate.



1.5 Upper Rear Cover

(1) Remove the two screws from the upper rear cover.

(2) Release section "a" from the latch provided on the scanner mount and pull the top of the upper rear cover to the rear and upwards.



■ **Reassembling Notes**

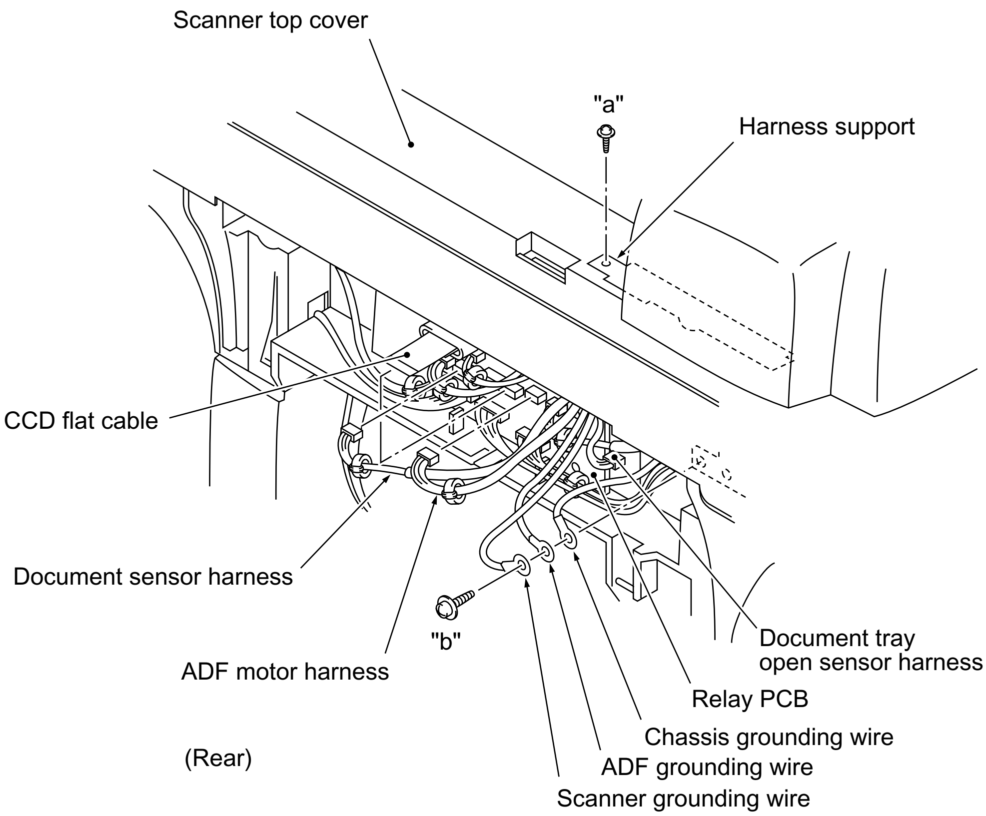
- When installing the upper rear cover, first hook sections "b" onto the supports of the scanner mount and push the upper rear cover into place.

1.6 ADF Unit and Document Tray Open Sensor

(1) Remove screw "a" from the harness support (which holds the document tray open sensor).

(2) Remove screw "b" to release the grounding wires.

(3) Disconnect the following from the relay PCB:
- CCD flat cable (P4)
- ADF motor harness (4-pin, P3)
- Document sensor harness (4-pin, P8)
- Document tray open sensor harness (2-pin)



"a": Cup B tite M3x10
"b": Taptite, cup S M3x6

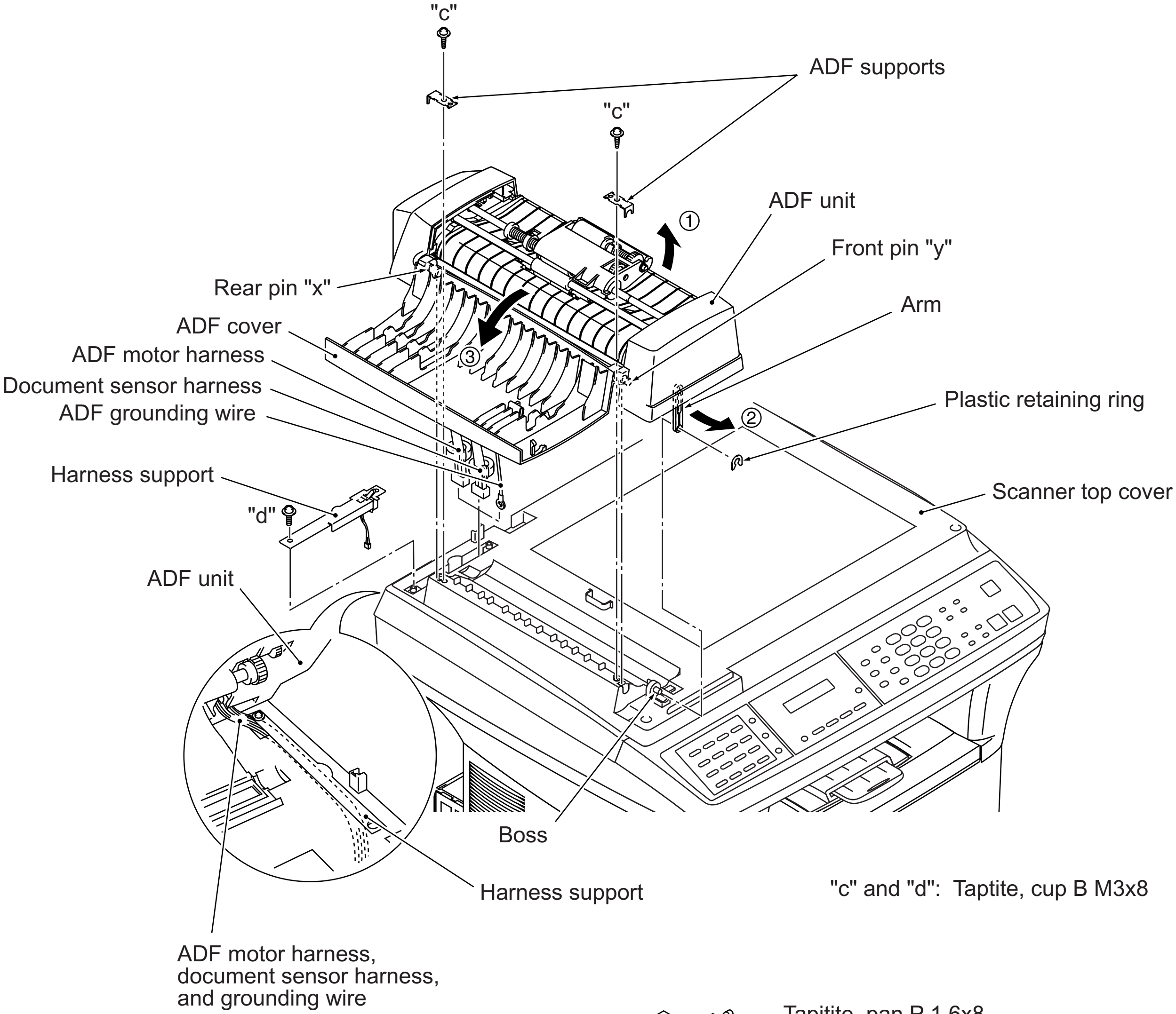
(4) Turn the ADF unit in the direction of arrow ①, remove the plastic retaining ring, and release the arm (arrow ②) from the boss provided on the scanner top cover. Turn the ADF unit back into place.

(5) Open the ADF cover (arrow ③) and remove two screws "c."

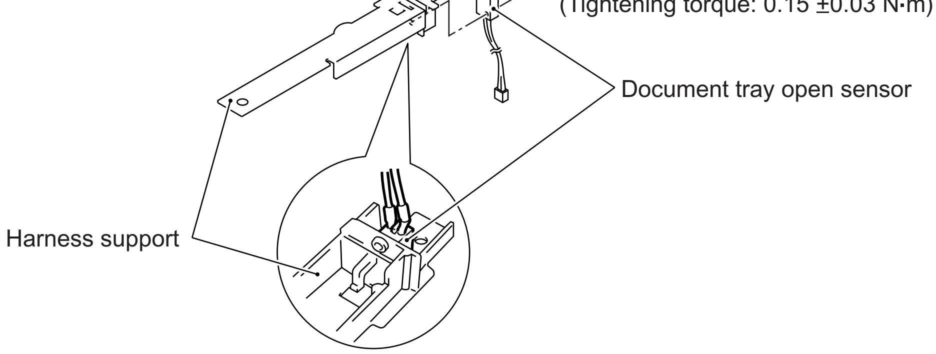
(6) Lift up the ADF unit while pulling out the ADF motor harness, document sensor harness, and grounding wire. The ADF supports also come off.

(7) Remove screw "d" and take off the harness support together with the document tray open sensor.

Remove the screw from the document tray open sensor.

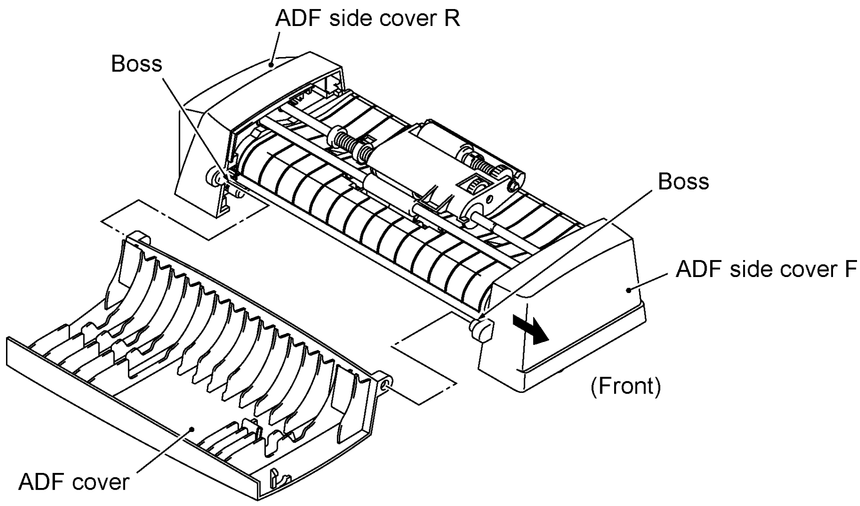


"c" and "d": Taptite, cup B M3x8



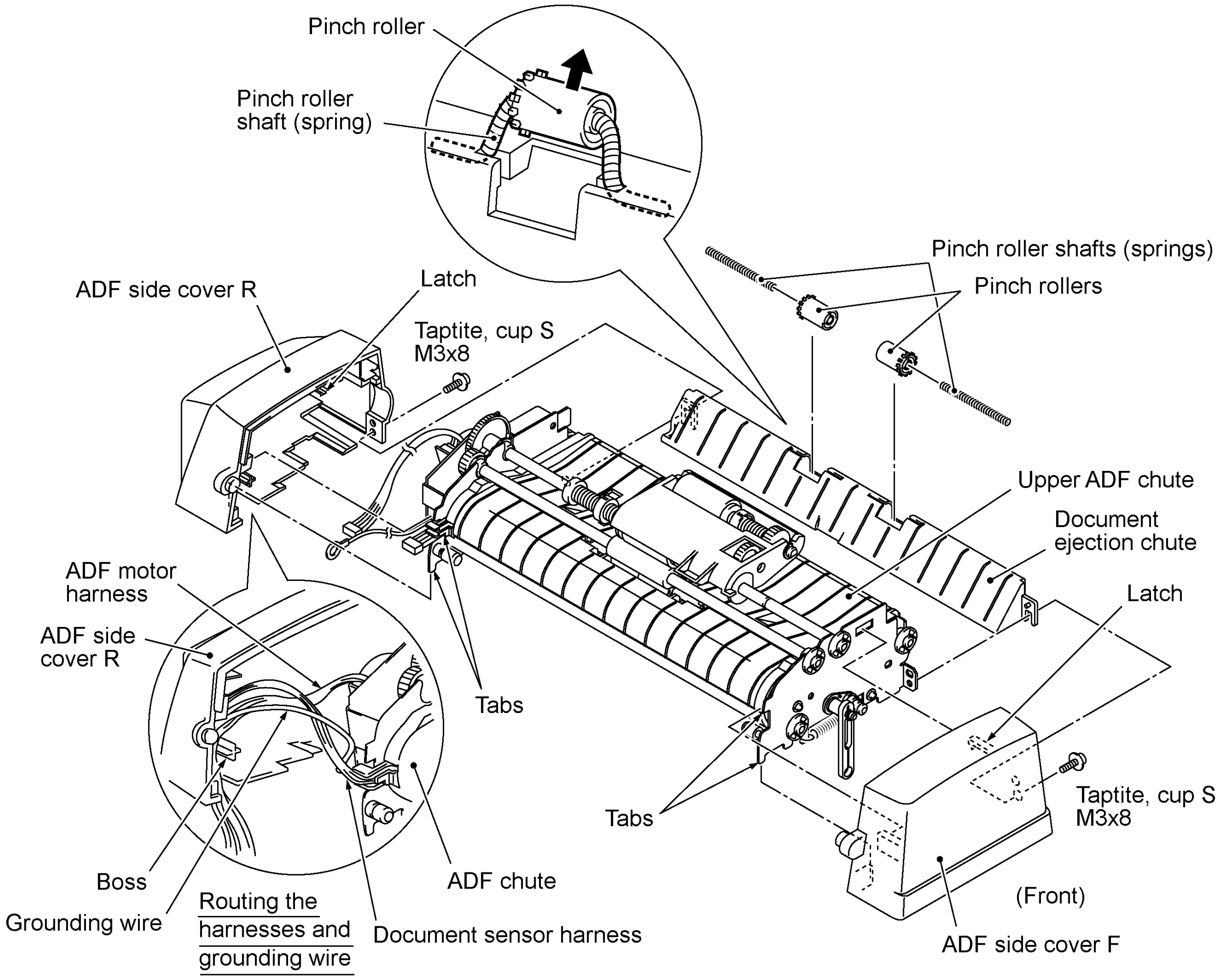
[Disassembling the ADF Unit]

1) Open the ADF cover. Pull the ADF side cover outwards and release the ADF cover from the bosses provided on the ADF side covers.



2) At each of the ADF side covers F and R, remove the screw, pull the unscrewed corner outwards to release it from the document ejection chute, and unhook the latch.

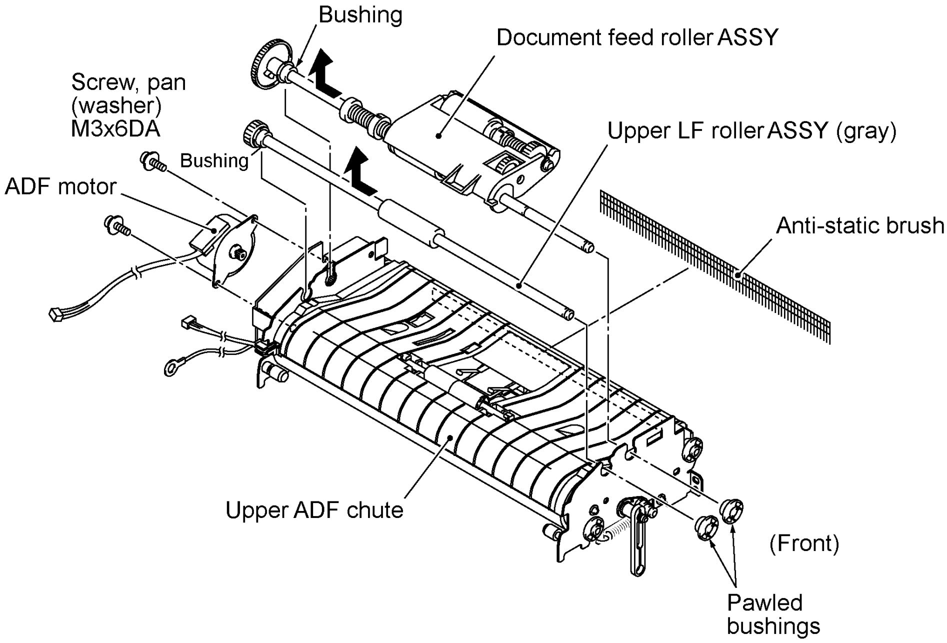
3) Remove the document ejection chute (which has been secured with the screws removed in step 2) above).



4) At the front end of the document feed roller shaft, remove the pawled bushing by pulling its pawls outwards. At the rear end, pull the bushing outwards and lift up the document feed roller ASSY.

5) At the front end of the upper LF roller (gray) shaft, remove the pawled bushing by pulling its pawls outwards. At the rear end, pull the bushing outwards and lift up the upper LF roller ASSY.

6) Remove the two screws and take off the ADF motor.



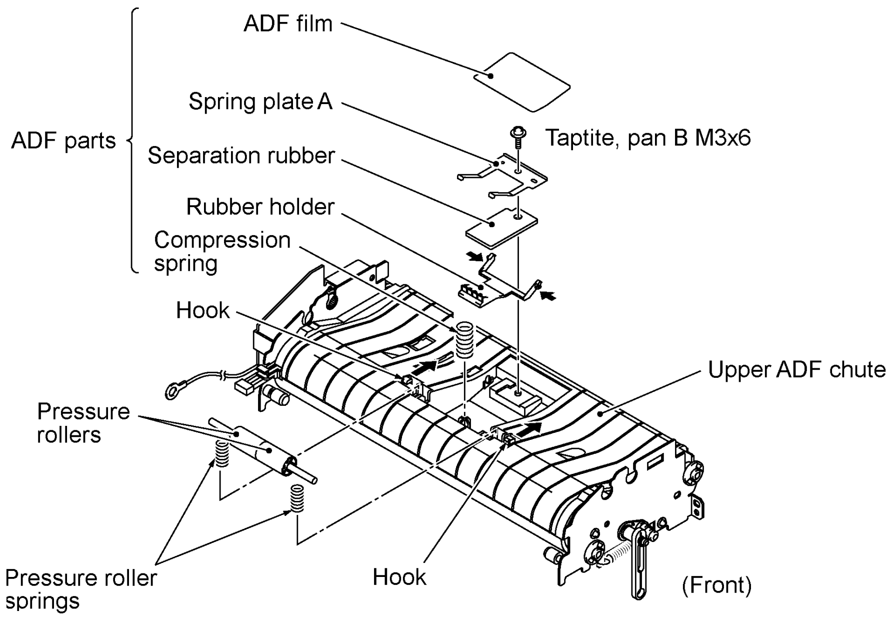
If you do not need to remove the ADF parts, skip to step 10).

7) Peel off the ADF film.

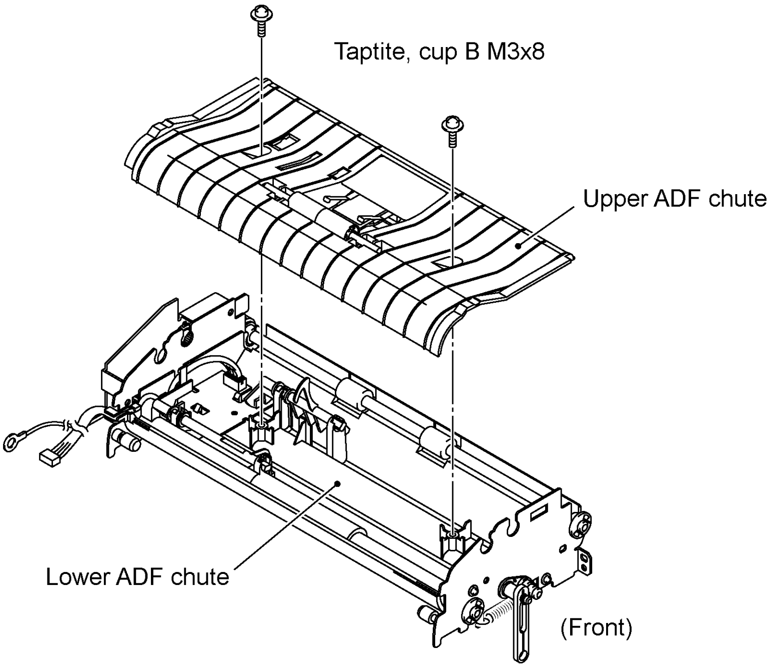
   NOTE: Once removed, the ADF film will become unusable and a new part will have to be put back in.

8) Remove the screw and take off the spring plate A, separation rubber, rubber holder, and compression spring.

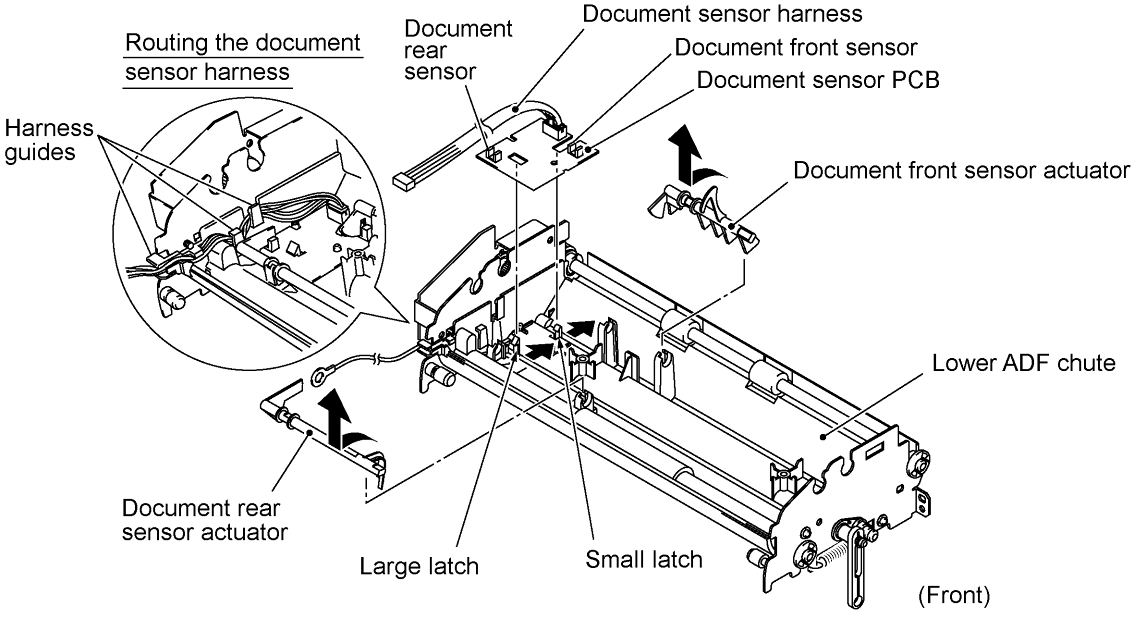
9) Push the hooks provided on the upper ADF chute and remove the pressure rollers and their springs.



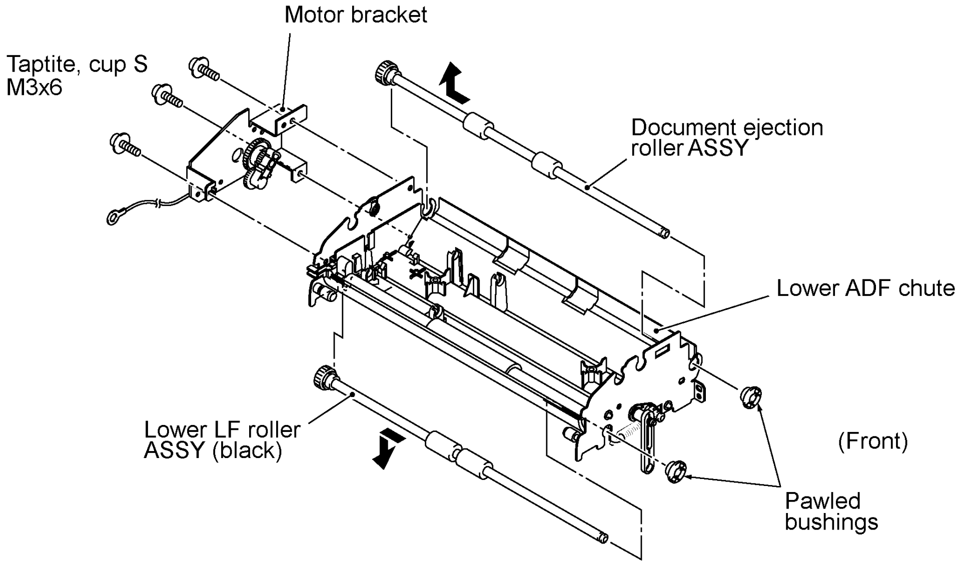
10) Remove the two screws and lift up the upper ADF chute.



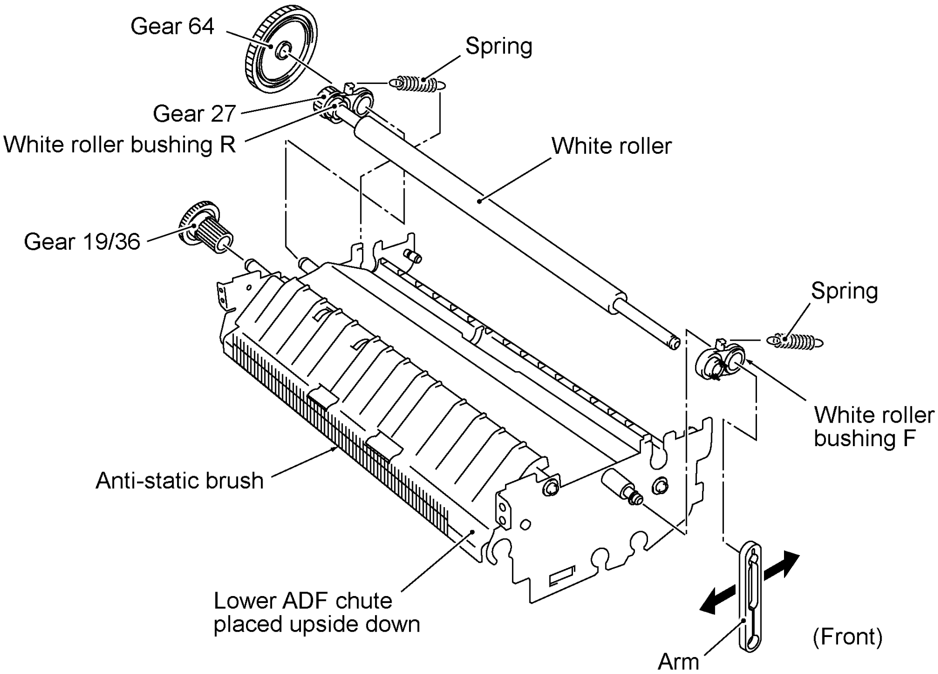
11) Turn the document front sensor actuator as shown below and lift it up.
12) Turn the document rear sensor actuator as shown below and lift it up.
13) Disconnect the document sensor harness from the document sensor PCB and take out its harness from the harness guides.
14) Unhook the two latches (large and small latches in this order) from the document sensor PCB and lift it up.



15) At the front end of the document ejection roller shaft, remove the pawled bushing by pulling its pawls outwards. At the rear end, pull the bushing outwards and lift up the document ejection roller ASSY.
16) Remove the three screws and take off the motor bracket.
17) At the front end of the lower LF roller (black) shaft, remove the pawled bushing by pulling its pawls outwards. At the rear end, pull the bushing outwards and remove the lower LF roller ASSY.

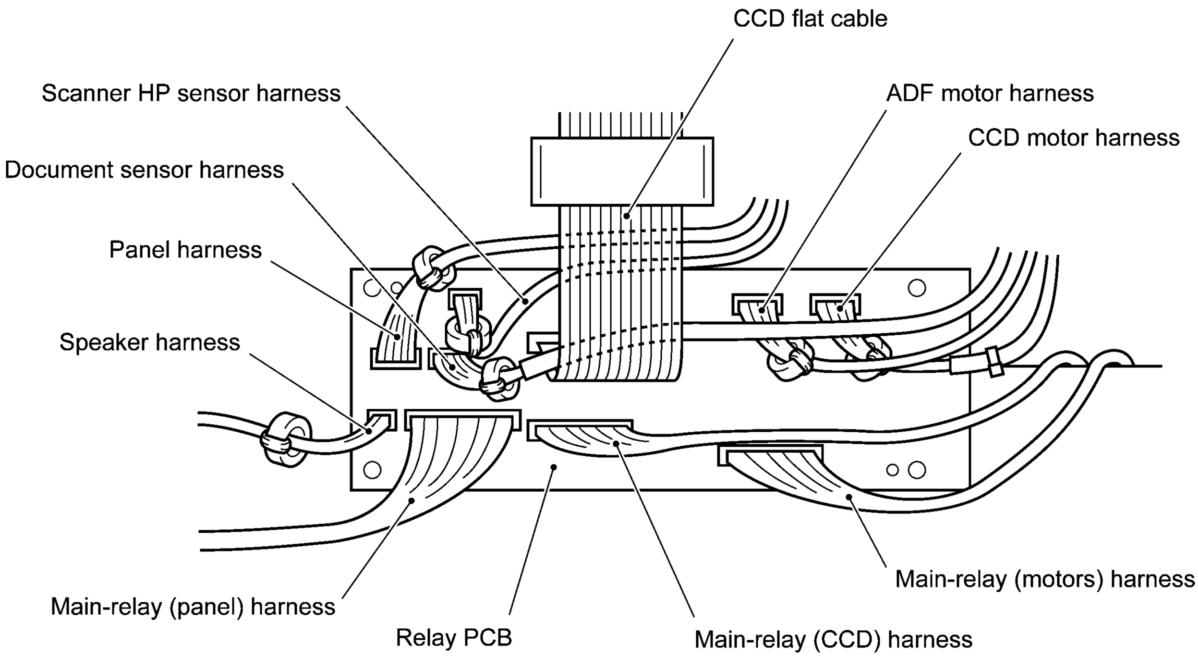


18) Turn the lower ADF chute upside down.
19) Pull the arm outwards and take it off.
20) At the rear side of the lower ADF chute, remove the gear 19/36 by pulling its pawl outwards.
21) Remove the gear 64 by pulling its pawl outwards.
22) Unhook the two springs.
23) Pull out the white roller bushing F by pulling its pawls outwards.
24) Remove the white roller together with the white roller bushing R and gear 27.



■ Reassembling Notes

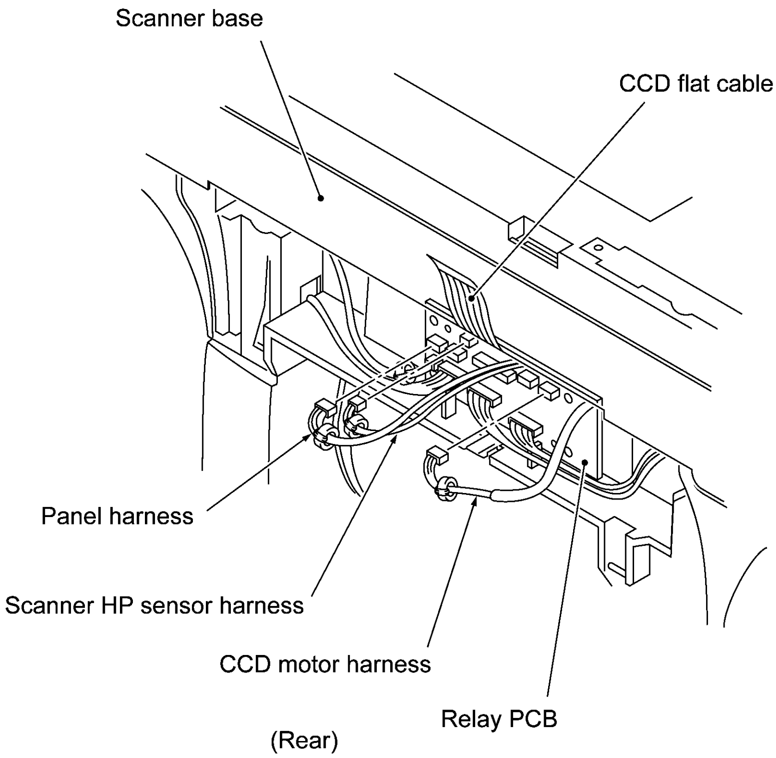
- Take care not to mistake the upper LF roller ASSY (gray) for the lower LF roller ASSY (black).
- When setting the document sensor PCB back into place, do not push it down straight, but first fit the PCB in the large latch and then fit it in the small latch (see the illustration given on page IV-13).
- Be sure to route the document sensor harness through the three harness guides so that it will not interfere with the document rear sensor actuator. (See the illustration given on page IV-13.)
- Reinstall the ADF motor with its connector side facing up. (See the illustration given on page IV-12.)
- Reinstall the ADF side covers so that the tabs of the ADF side plates become fitted inside the ribs provided on the ADF side covers. (See the illustration given on page IV-11.)
- When reinstalling the ADF side cover R, be sure to route the document sensor harness, ADF motor harness, and grounding wire between the boss and the ADF side cover R. (See the illustration given on page IV-11.)
- When reinstalling the ADF unit, first set the ADF support onto rear pin "x" of the ADF unit, set the ADF unit back into place, set the other ADF support onto front pin "y," then secure those ADF supports with two screws "c." (See the illustration given on page IV-10.)
- When connecting the ADF motor harness, document sensor harness, and grounding wires to the relay PCB, route them as shown below.



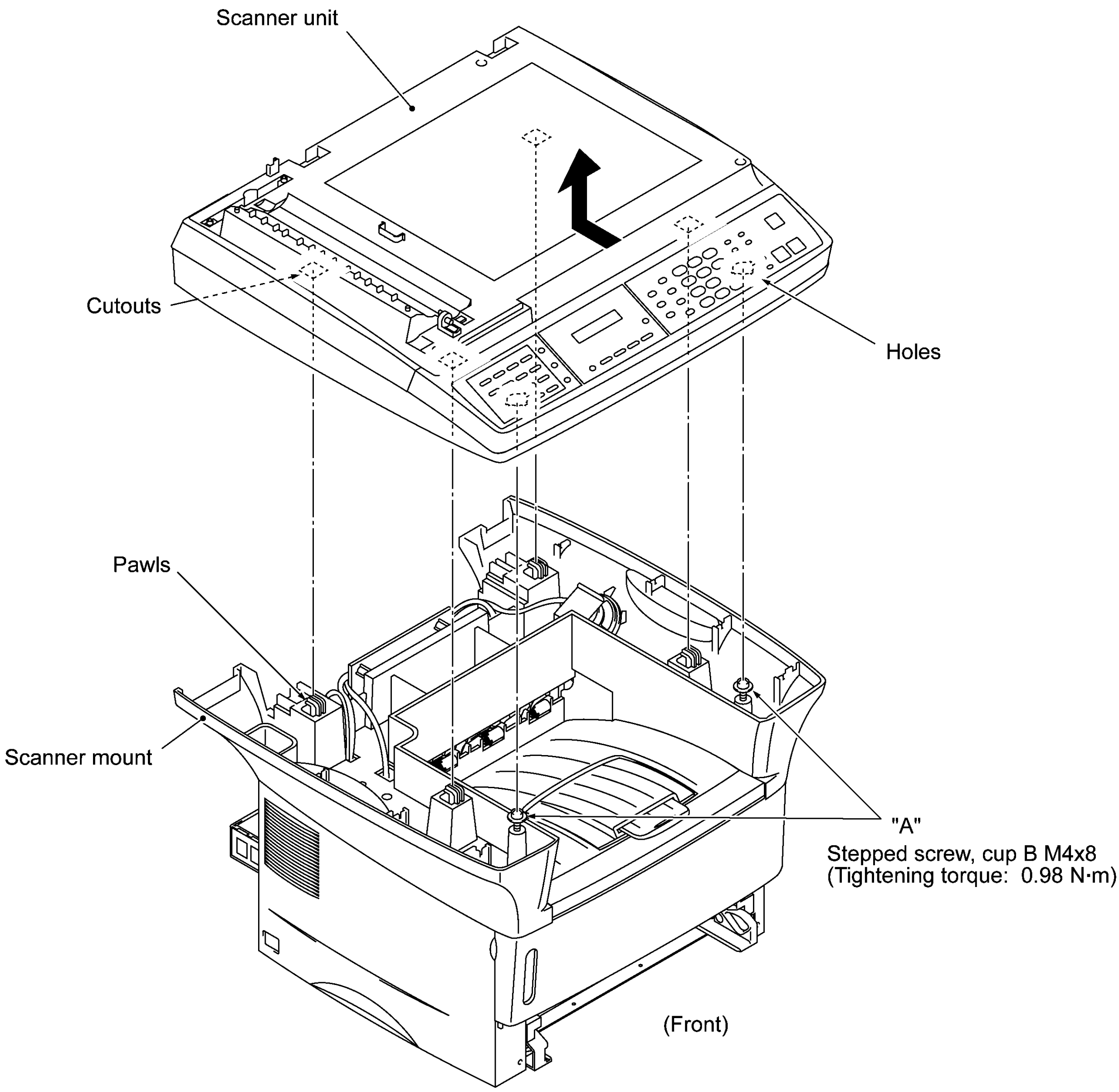
1.7 Scanner Unit and Control Panel ASSY

(1) Disconnect the following from the relay PCB:

- CCD motor harness
- Panel harness
- Scanner HP sensor harness



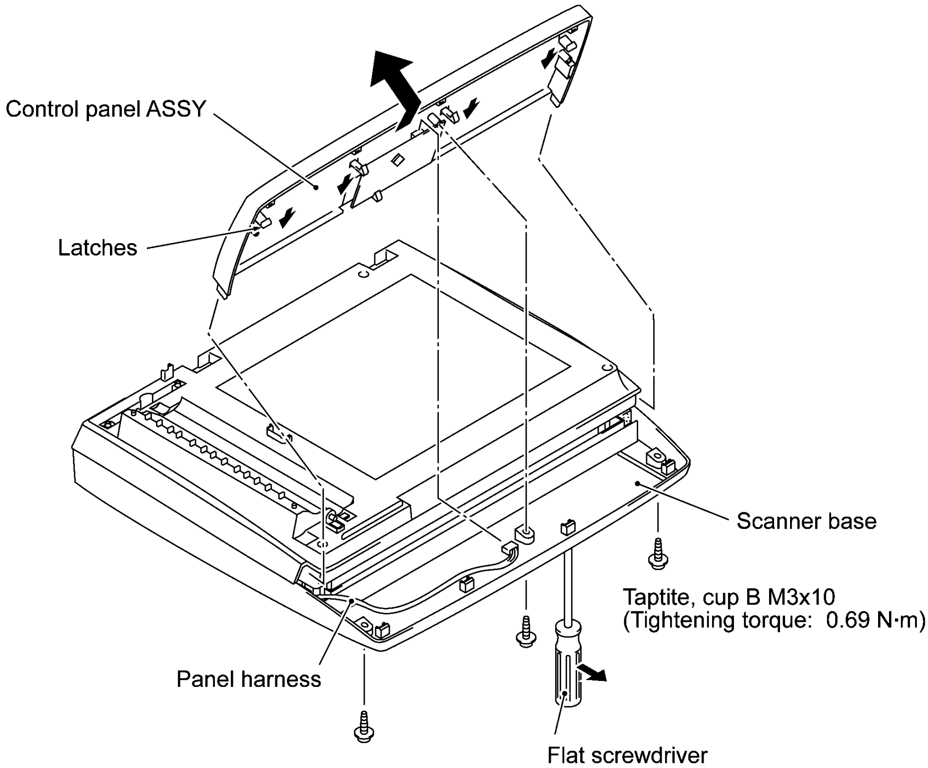
(2) Slide the scanner unit (with the control panel ASSY) to the rear by approx. 5 mm and then lift it up. (For the disassembly procedure of the scanner unit, refer to page IV-19.)



(3) Remove the three screws from the underside of the scanner base.

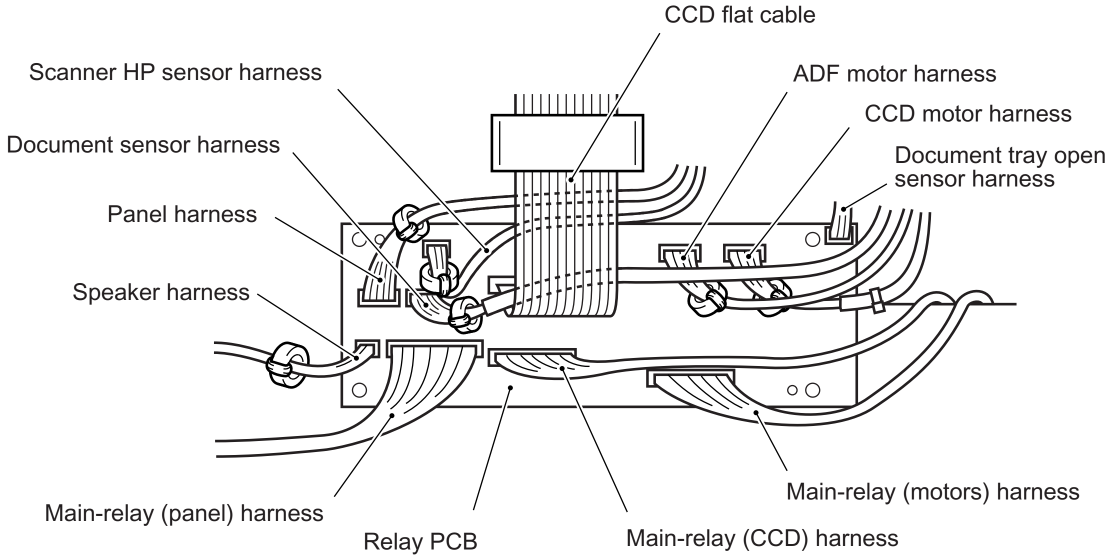
(4) Insert the tip of a flat screwdriver into each of the four holes provided in the scanner base and unhook the four latches while lifting up the control panel ASSY.

(5) Disconnect the panel harness from the control panel PCB. (For the disassembly procedure of the control panel ASSY, refer to page IV-24.)

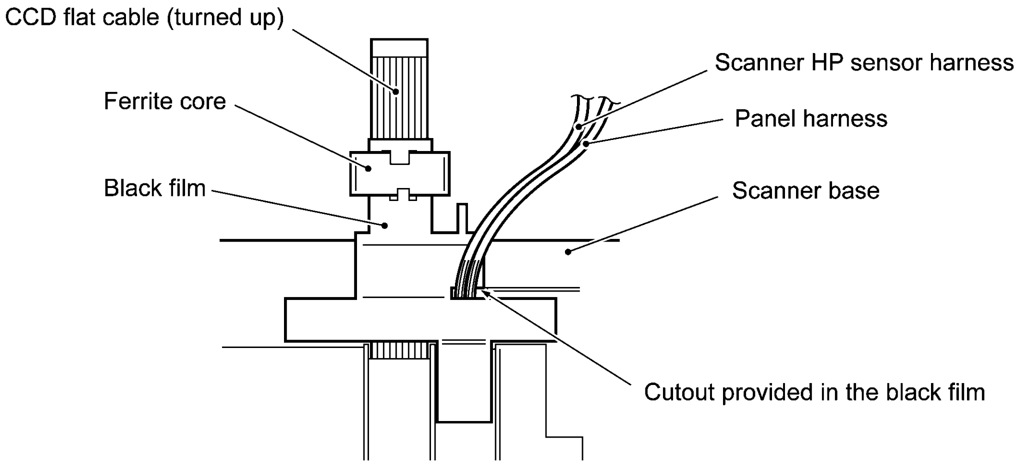


■ Reassembling Notes

- When reinstalling the scanner unit, fit the holes and cutouts provided in the scanner unit over screws "A" and pawls of the scanner mount, respectively, and then slide the scanner unit to the front. (Refer to page IV-17.)
- When connecting the CCD motor harness, panel harness, and scanner HP sensor harness to the relay PCB, route them as shown below.



- When connecting the CCD motor harness, panel harness, and scanner HP sensor harness to the relay PCB, route them as shown below.

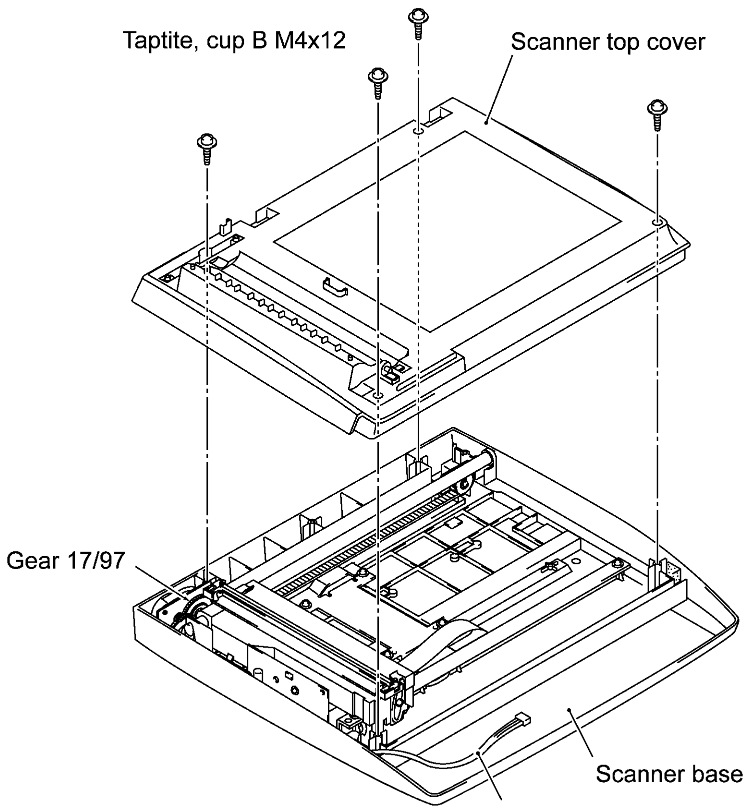


Viewed from the bottom

[Disassembling the Scanner Unit]

The disassembling job of the scanner unit should be done in a clean room to prevent dust or dirt from getting into the scanner unit.

1) Remove the four screws from the scanner top cover.
2) Separate the scanner top cover from the scanner base.



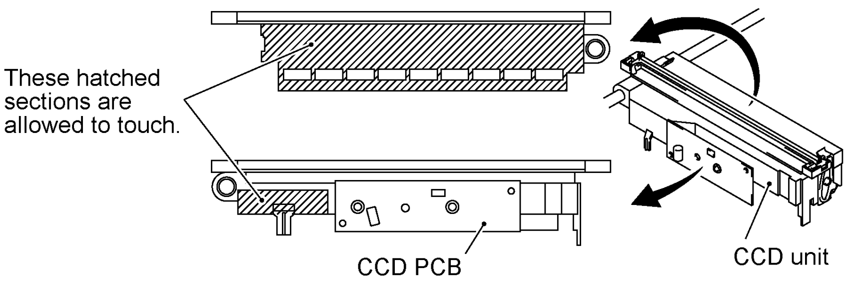
3) Turn the gear 17/97 to move the CCD unit to the right to make the following job easier.

4) Remove screw "a" and take out the CCD rail clamp. (See the illustration given on the next page.)

5) Remove two screws "b" from the CCD idle pulley holder, then remove the CCD drive belt from the idle pulley.

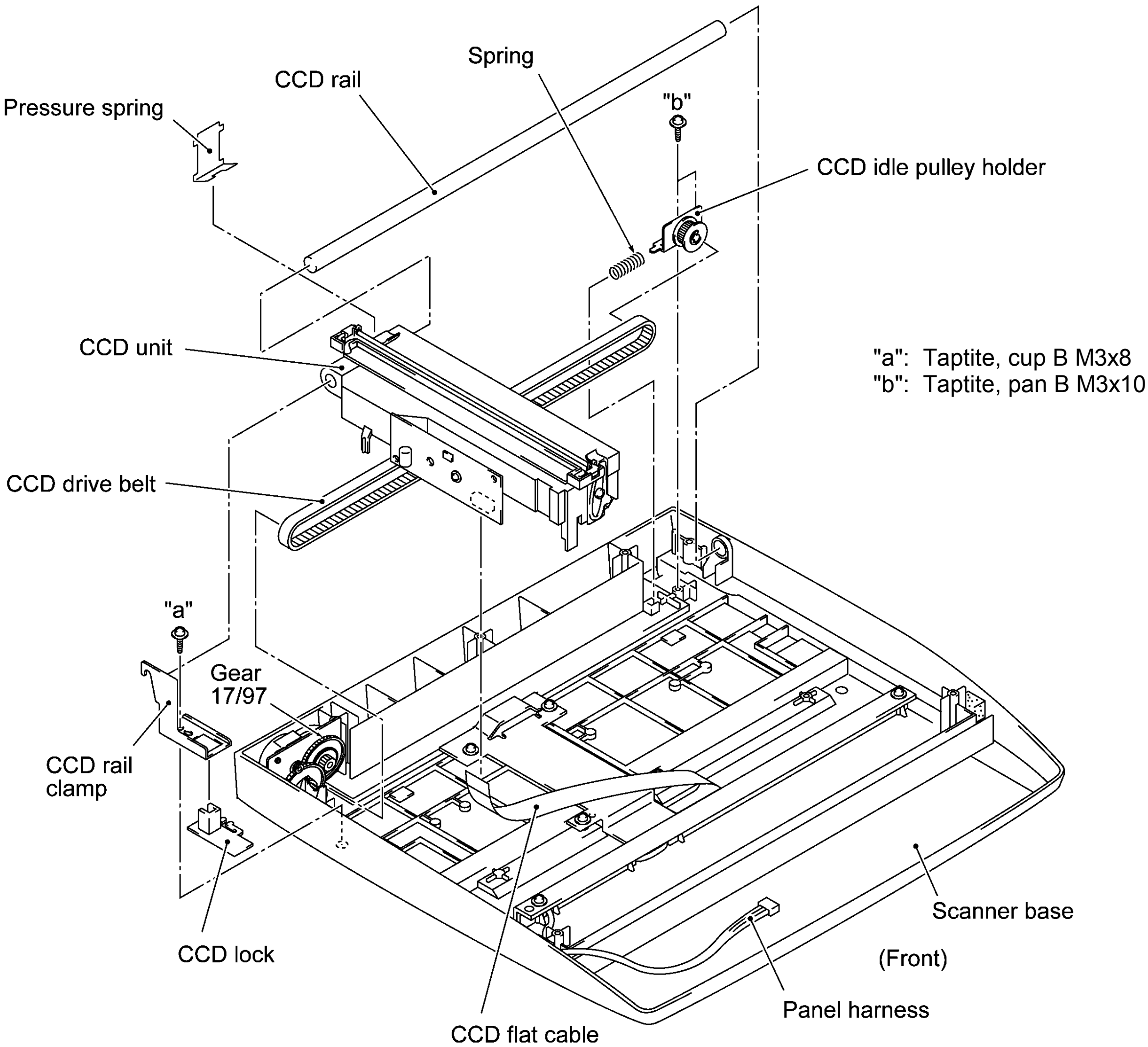
6) Lift up the CCD rail together with the CCD unit and CCD drive belt, and then disconnect the CCD flat cable.

NOTE: When handling the CCD unit, do not touch the CCD PCB or glasses but hold the hatched sections as shown below.



7) Pull out the CCD rail from the CCD unit.

8) Remove the CCD lock.

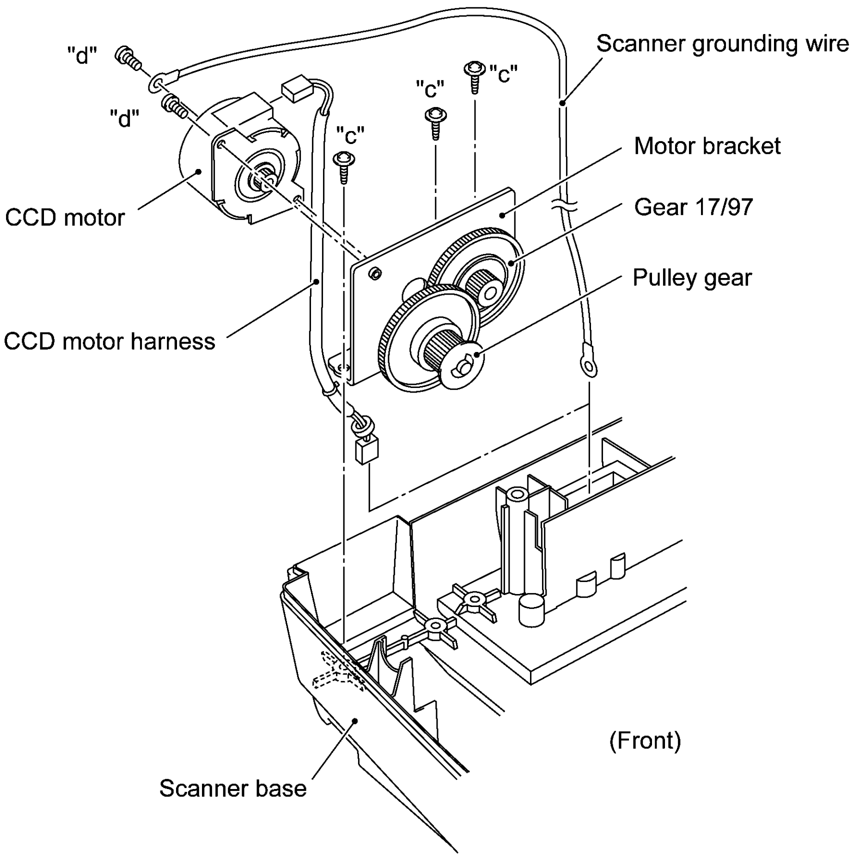


9) Pull up the CCD motor harness and disconnect it from the CCD motor.

10) Remove three screws "c" from the motor bracket.

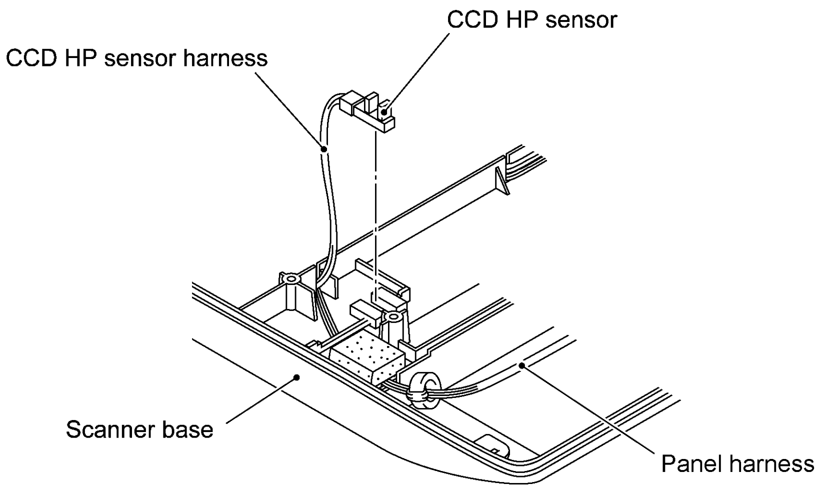
11) Lift up the motor bracket.

12) Remove two screws "d" from the CCD motor. The scanner grounding wire also comes off.



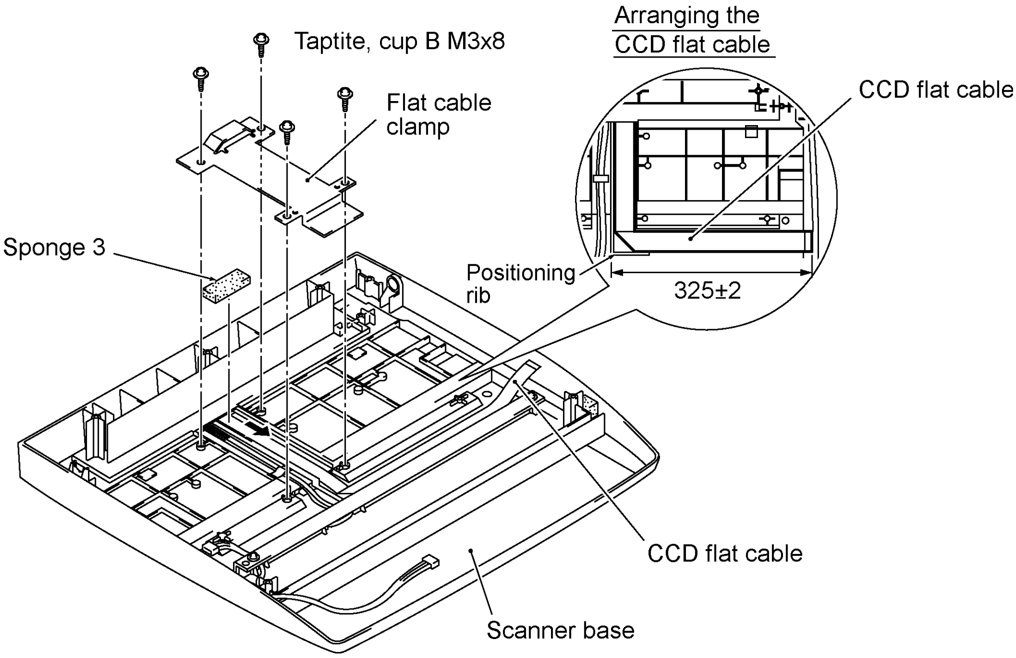
13) Disconnect the CCD HP sensor harness from the sensor.

14) Remove the CCD HP sensor.



15) Remove the four screws and take off the flat cable clamp. Remove sponge 3 attached with adhesive tape.

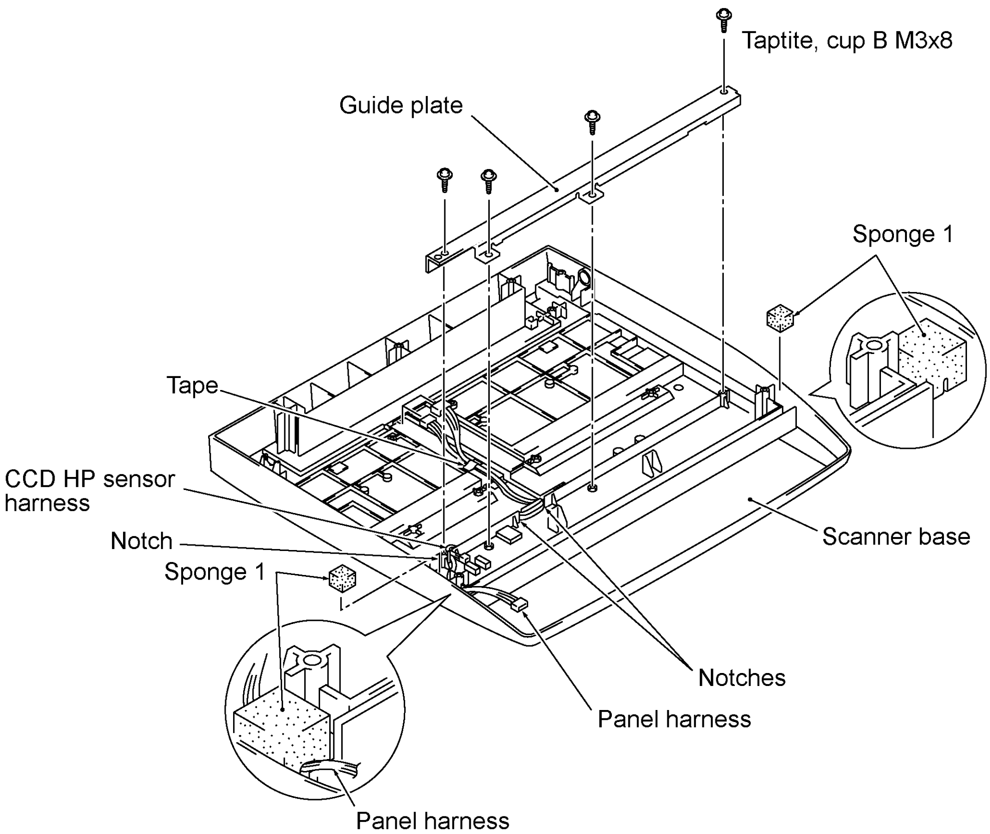
16) Remove the CCD flat cable (which is attached with adhesive tape).



17) Remove the four screws and take off the guide plate.

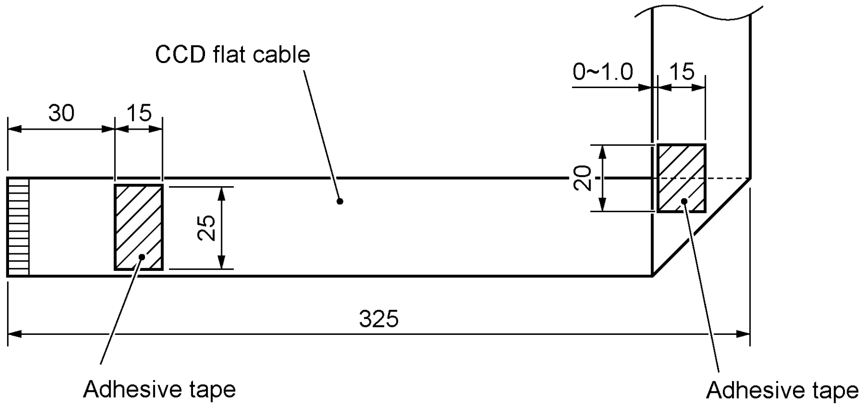
18) Remove tape and sponges 1, then take out the panel harness and CCD HP sensor harness.

NOTE: Once removed, the sponges 1 will become unusable and new ones will have to be put back in.

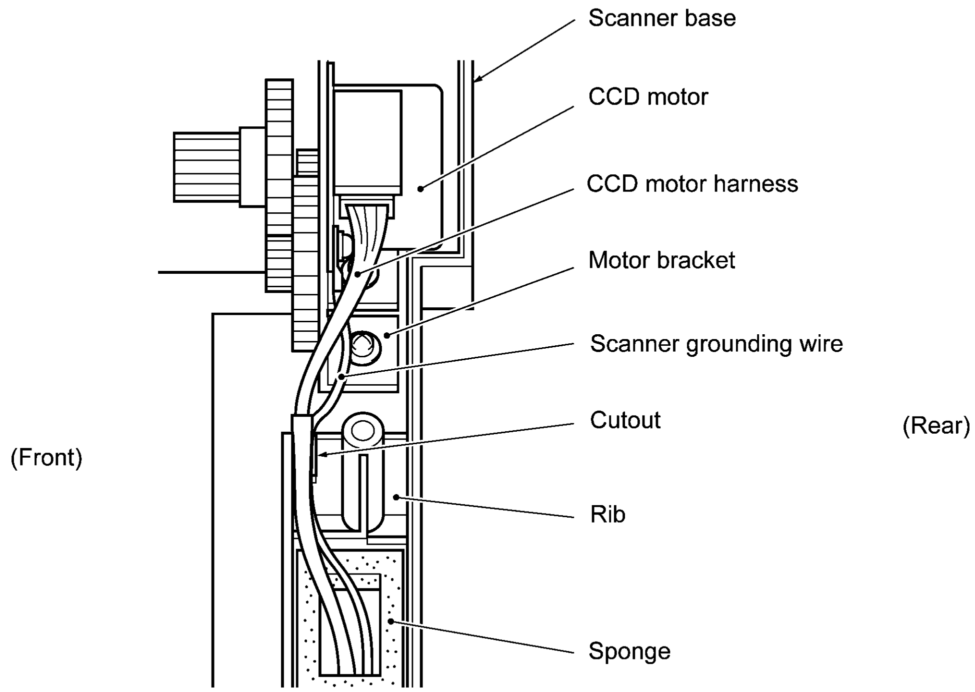


■ Reassembling Notes

- Route the panel harness and CCD HP sensor harness through the three notches, then tape them as illustrated on the previous page.
- When replacing the CCD flat cable with a new one, be sure to arrange the new cable as illustrated below, then route it along the positioning rib as shown on the previous page.



- Set the CCD motor back into place with its connector side facing up as shown on page IV-21. When securing the motor with screws "d," be sure to secure the scanner grounding wire also as shown on page IV-21.
- Route the CCD motor harness and scanner grounding wire as illustrated below.

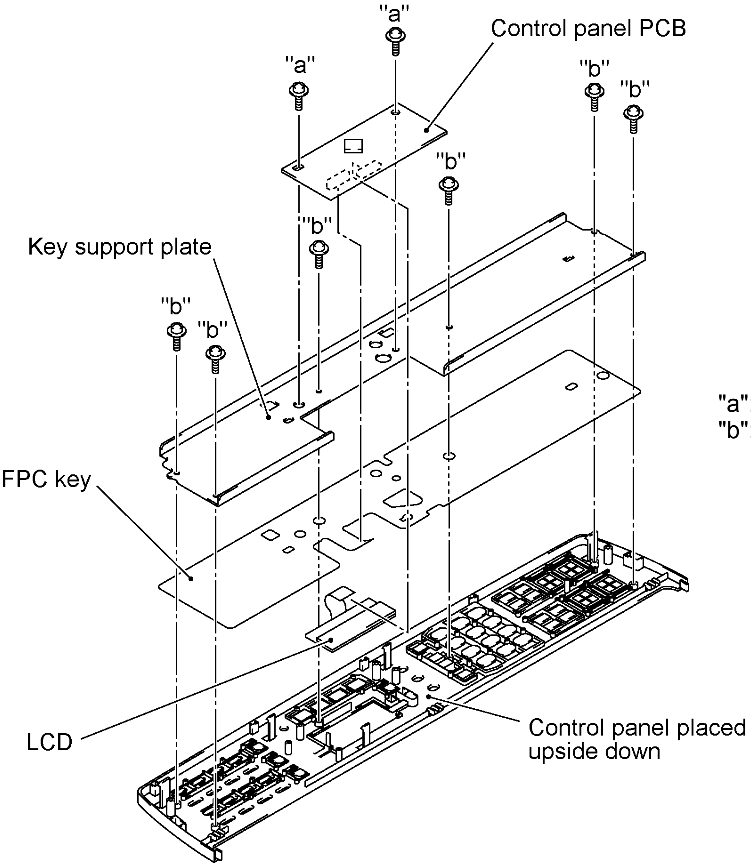


(Viewed from the top)

- Set the CCD lock in the release (forward) position. If the CCD lock is placed in the lock position, the CCD home positioning will fail in the next powering-up sequence. If this happens, turn the CCD lock to the release position.

[Disassembling the Control Panel ASSY]

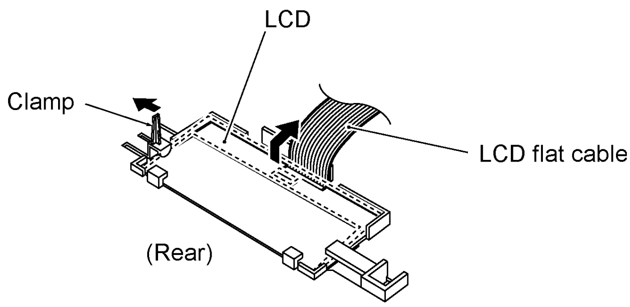
1) Turn the control panel ASSY upside down.
2) Remove two screws "a."
3) Slightly lift up the control panel PCB, then unlock the FPC key connector and disconnect the FPC key. Next, unlock the LCD cable connector and disconnect the LCD flat cable.
4) Remove six screws "b."
5) Remove the key support plate and FPC key.



"a": Taptite, cup B M2.6x8
"b": Taptite, cup B M3x6

6) As shown below, slightly pull the clamp outwards and take out the LCD while pulling the LCD flat cable gently.

NOTE: Do not take out the LCD except when the LCD is defective and requires replacement.



■ Reassembling Notes

- Before reinstalling the LCD to the control panel, wipe fingerprints or dust off the LCD surface and control panel window with a soft cloth.
- A new LCD is covered with a protection sheet. Before installing it, remove the protection sheet.

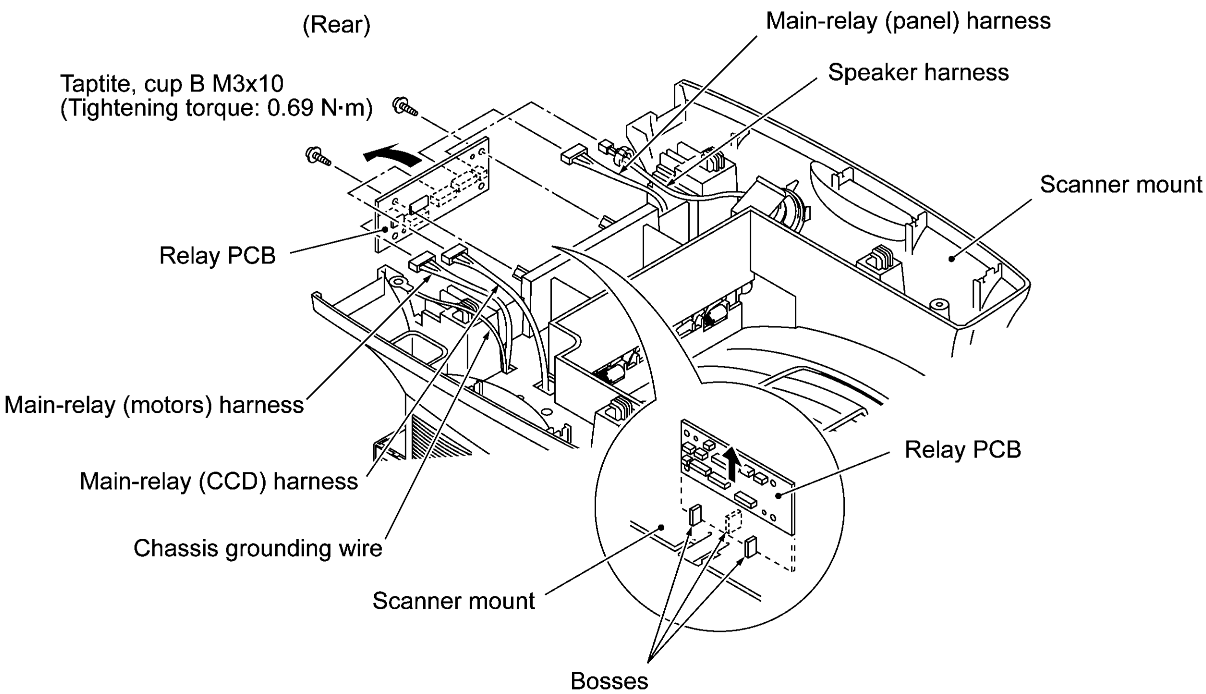
1.8 Relay PCB

(1) Disconnect the following harnesses from the relay PCB:

- Speaker harness
- Main-relay (panel) harness
- Main-relay (CCD) harness
- Main-relay (motors) harness

(2) Remove the two screws.

(3) Take out the relay PCB.



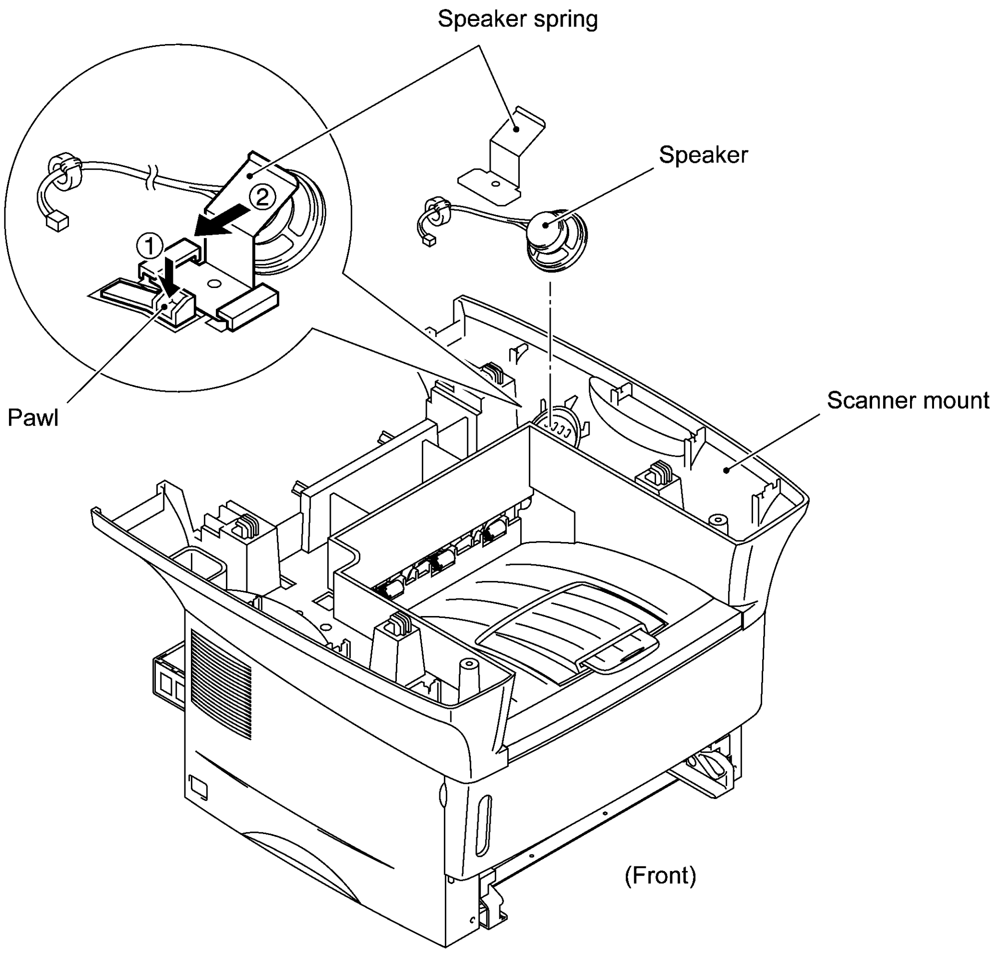
■ Reassembling Notes

- When setting the relay PCB back into place, be careful with the installation direction. The printed letters should not be upside down.

1.9 Speaker

(1) Press the pawl in the direction of arrow ① and slide the speaker spring in the direction of arrow ②.

(2) Lift up the speaker.



1.10 Scanner Mount

(1) Remove two screws "a."

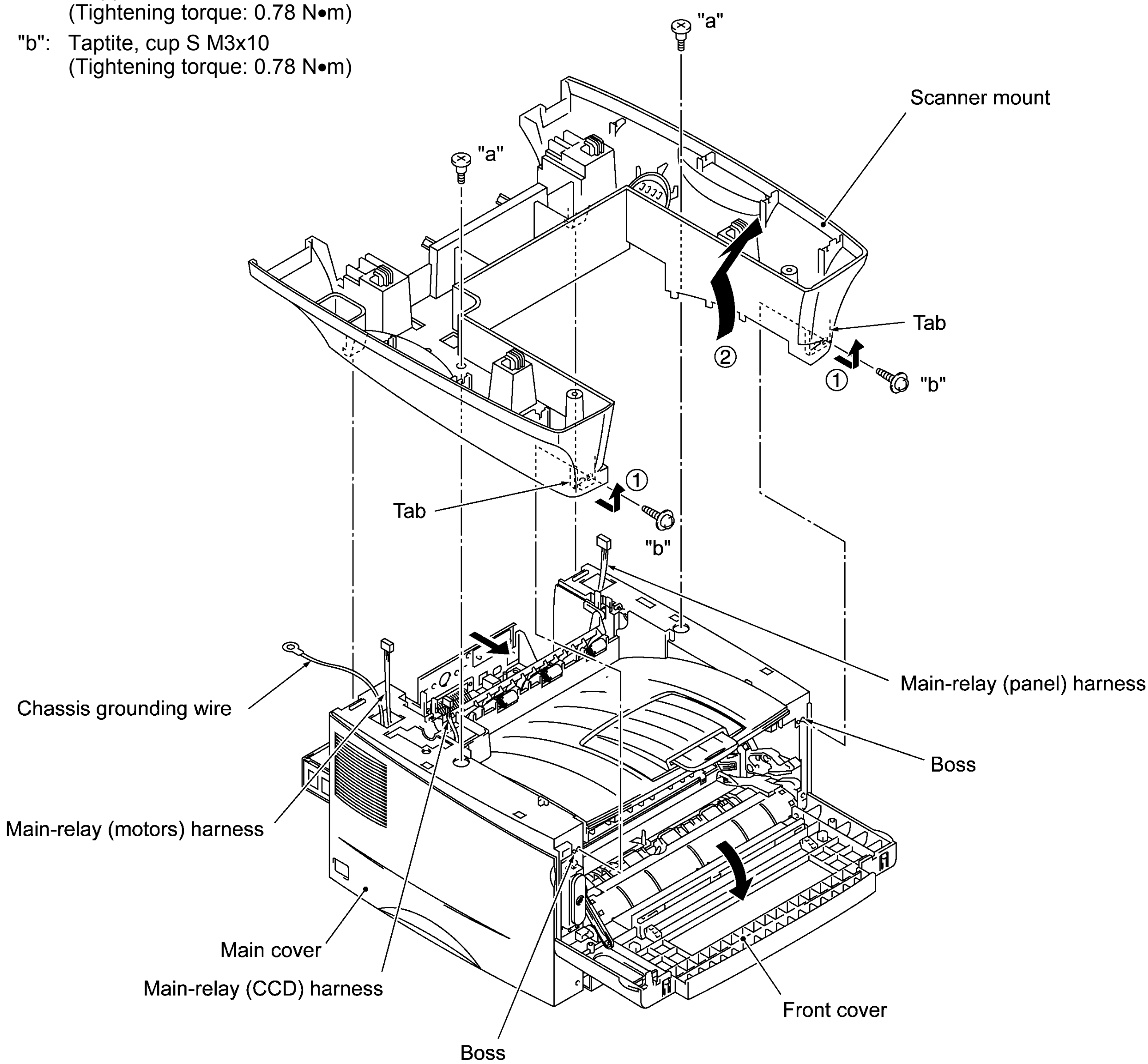
(2) Open the front cover and remove two screws "b."

(3) Pull the tabs of the scanner mount to the front and upwards (in the direction of arrows ①) to release them from the bosses provided on the main cover.

(4) Lift up the scanner mount in the direction of arrow ②.

"a": Stepped screw
(Tightening torque: 0.78 N•m)

"b": Taptite, cup S M3x10
(Tightening torque: 0.78 N•m)

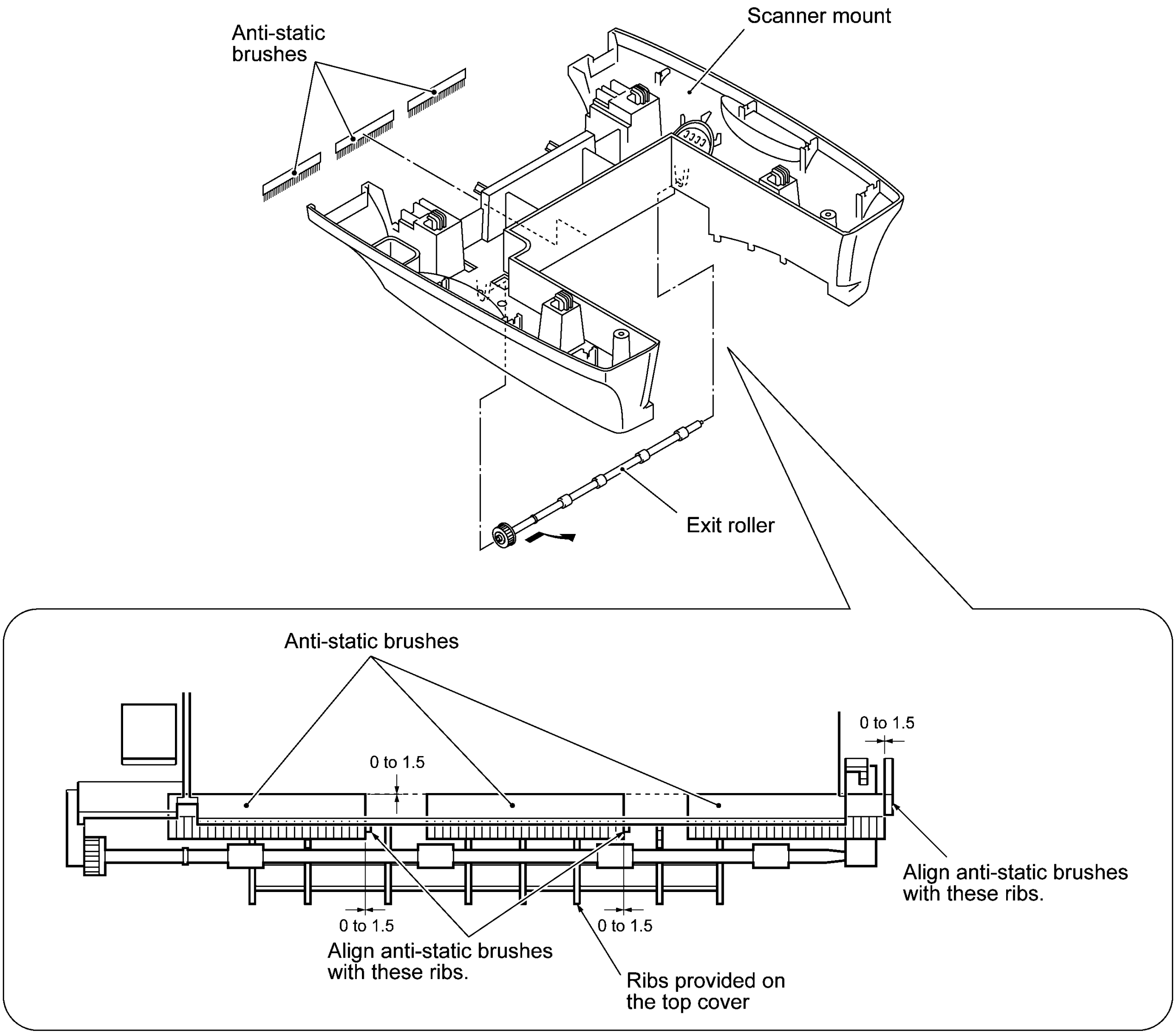


(5) Turn the scanner mount upside down.

(6) Peel off anti-static brushes.

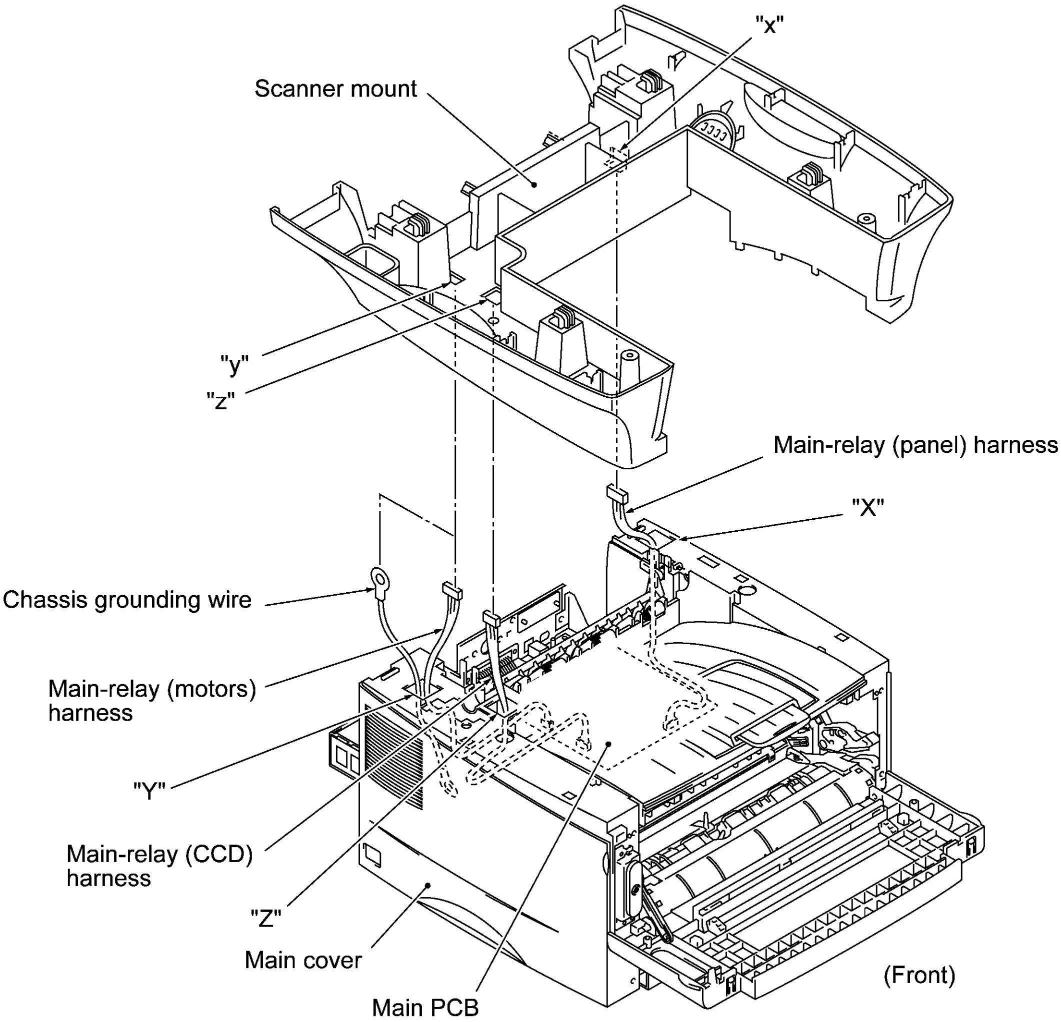
NOTE: Once removed, they will become unusable and new parts will have to be put back in.

(7) As shown below, warp the gear-equipped end of the exit roller and remove it.



■ Reassembling Notes

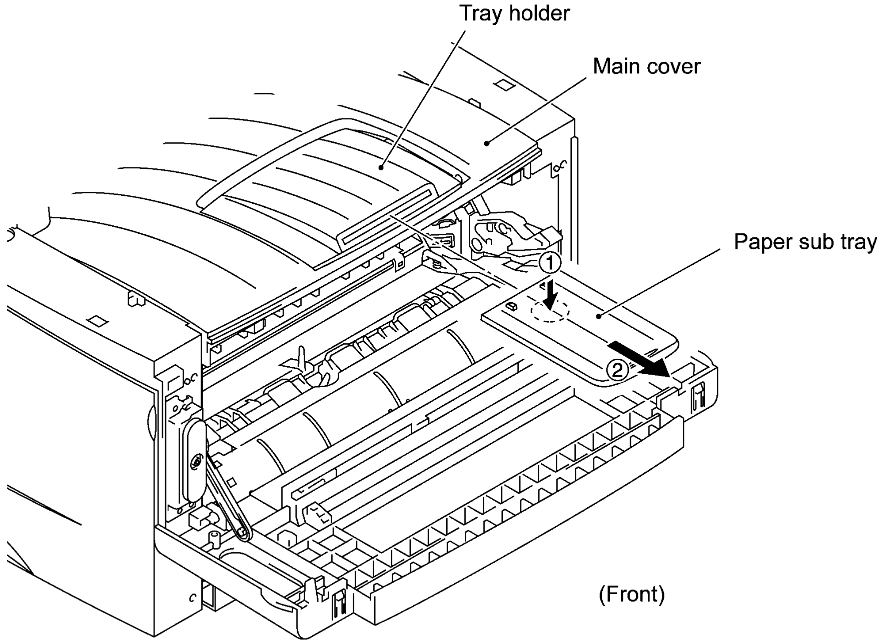
- When setting the scanner mount back into place:
  - at the right-hand side, raise the main-relay (panel) harness coming through the main cover up and through cutout "x" provided in the scanner mount.
  - at the left-hand side, pull up the main-relay (motors) harness and chassis grounding wire and raise them up and through square cutout "y" provided in the scanner mount. Also pull up the main-relay (CCD) harness and raise it up and through round cutout "z."



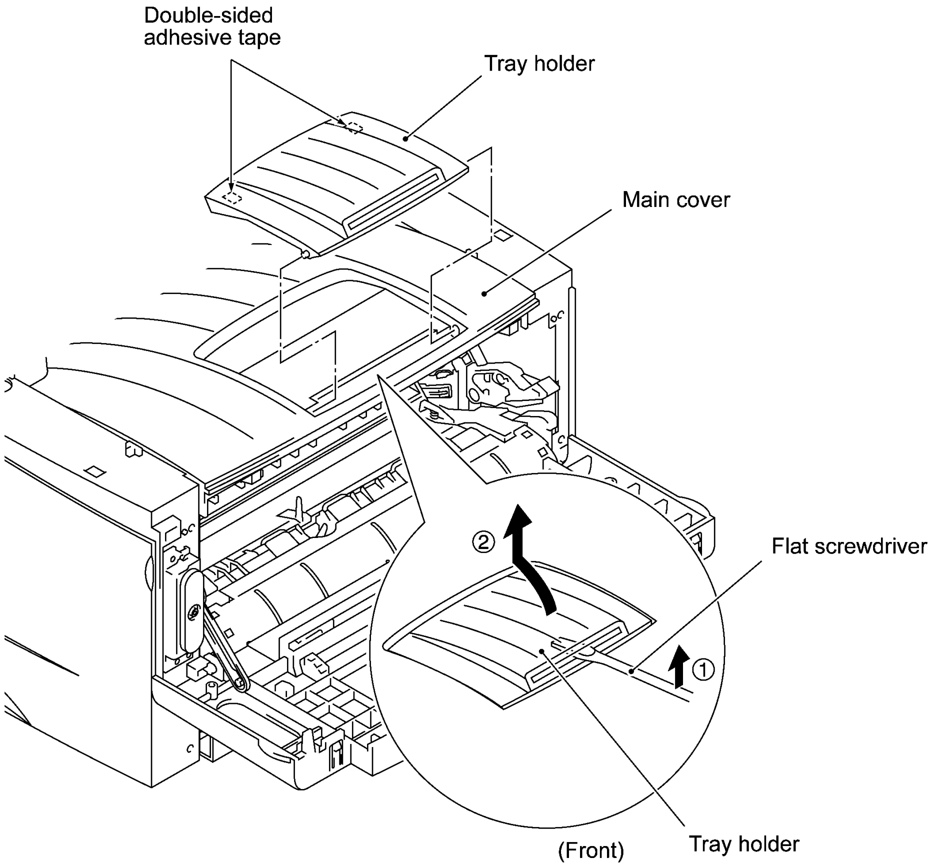
1.11 Paper Sub Tray and Tray Holder

(1) Pull out the paper sub tray.

(2) While pushing down the center of the paper sub tray to warp it (in the direction of arrow ①), pull it out of the tray holder (arrow ②).



(3) Insert the tip of a small flat screwdriver into the tray holder (in the direction of arrow ①) and pull up the tray holder (arrow ②).

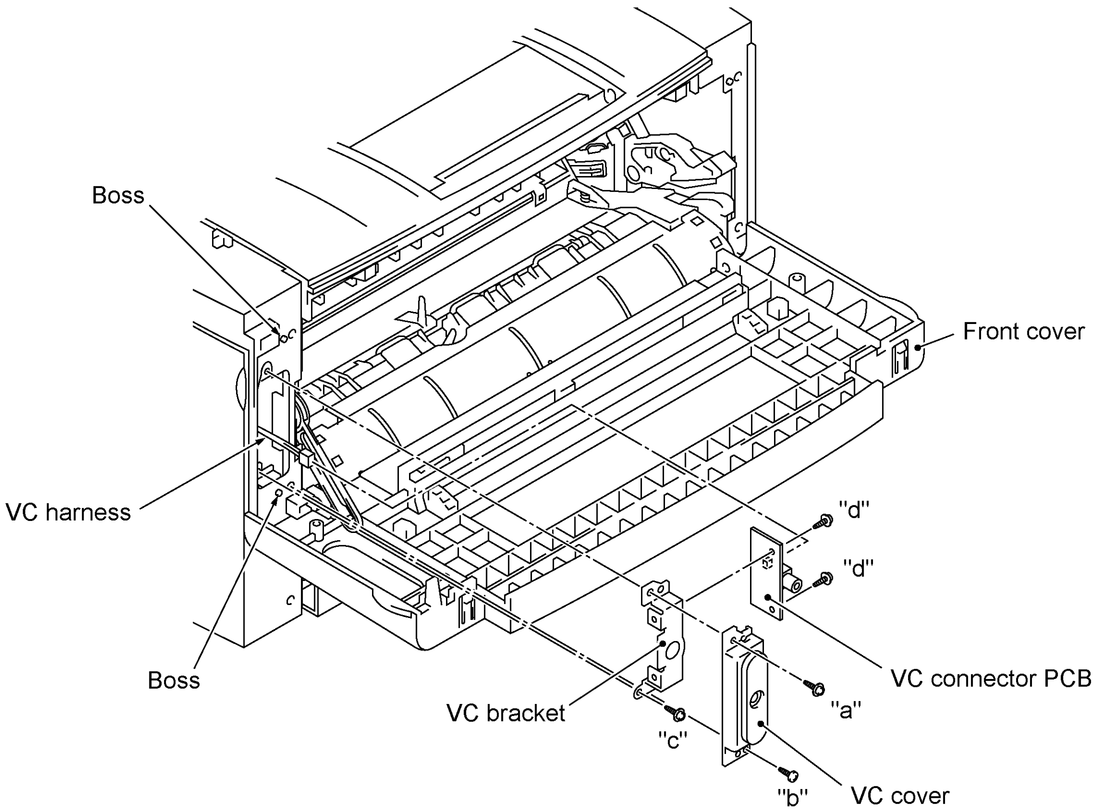


1.12 VC Cover, VC Bracket, and VC Connector PCB (for models supporting video capture)

(1) Remove two screws ("a" and "b"), then take off the VC cover.

(2) Remove screw "c," take out the VC bracket together with the VC connector PCB, and disconnect the VC harness.

(3) Remove two screws "d," then take off the VC connector PCB.



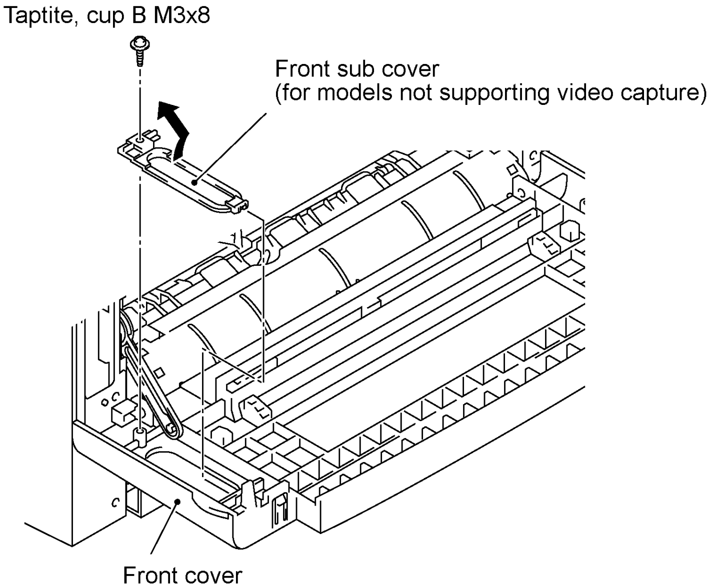
"a": Taptite, cup S M3x10
"b": Taptite, bind S M3x8
"c" and "d": Taptite, cup S M3x6

■ Reassembling Notes

- The routing of the VC harness is shown on page IV-34.

1.13 Front Cover
Front Sub Cover (for models not supporting video capture)

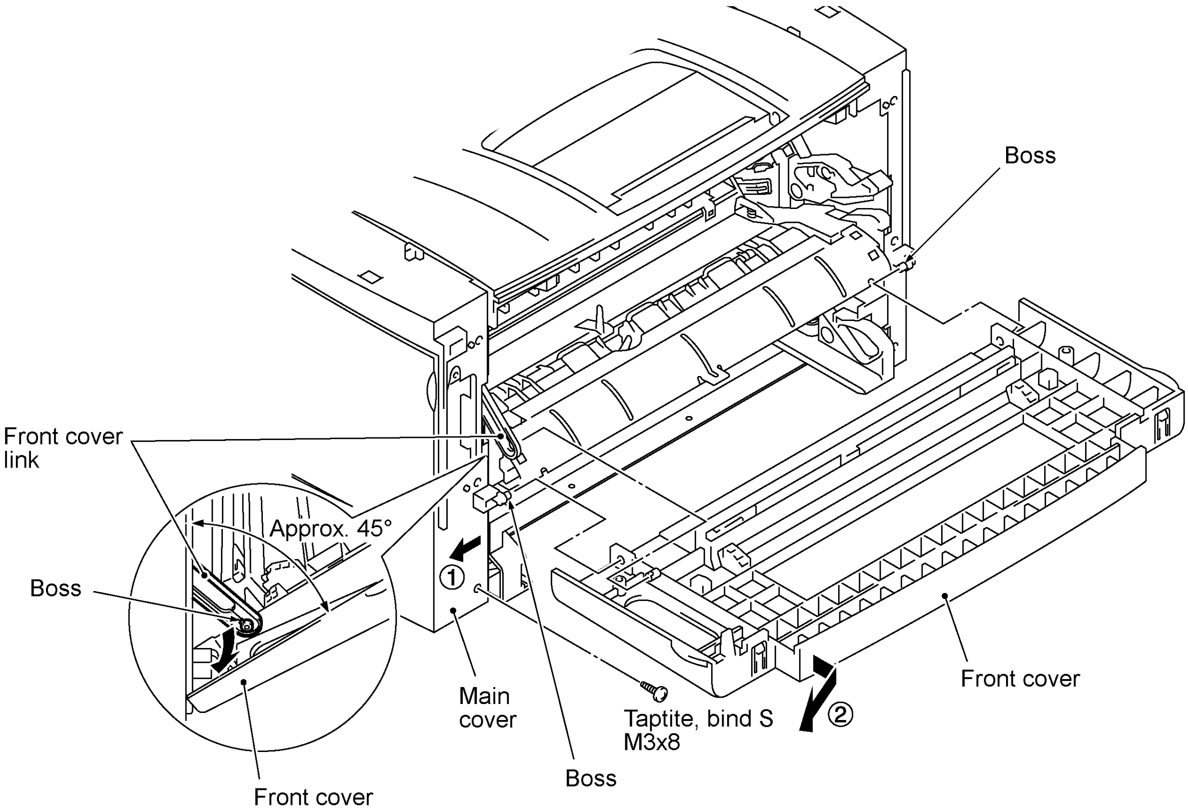
(1) For models not supporting video capture:
Remove the screw and take off the front sub cover from the front cover.



(2) Remove the screw from the left bottom of the front side of the main cover.

(3) Hold the front cover at an angle of 45° and pull the front cover link to the left to release it from the front cover.

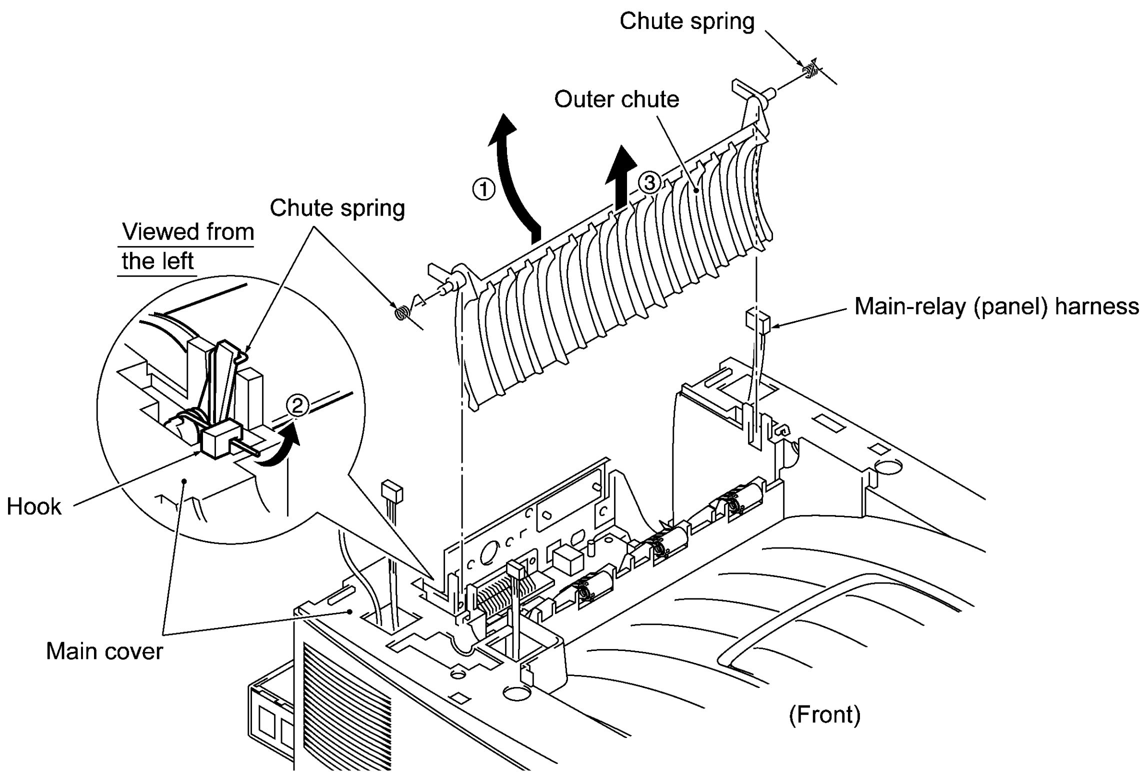
(4) Pull the bottom left front corner of the main cover to the left (in the direction of arrow ①) and release the front cover from the boss provided on the main cover (arrow ②).



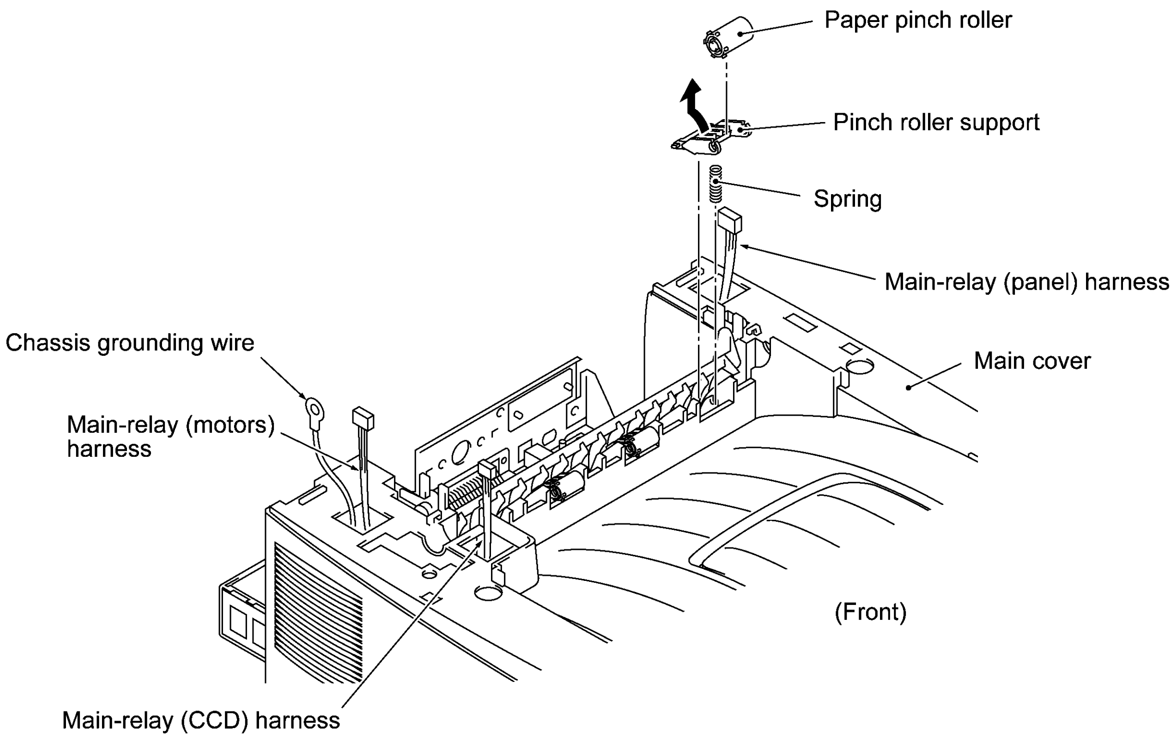
1.14 Outer Chute and Paper Pinch Rollers

(1) Pull up the outer chute and open it (in the direction of arrow ①).

(2) Remove the chute springs from the hooks provided on the main cover (arrow ②), then lift up the outer chute (arrow ③).



(3) Remove the paper pinch rollers, their supports, and their springs.

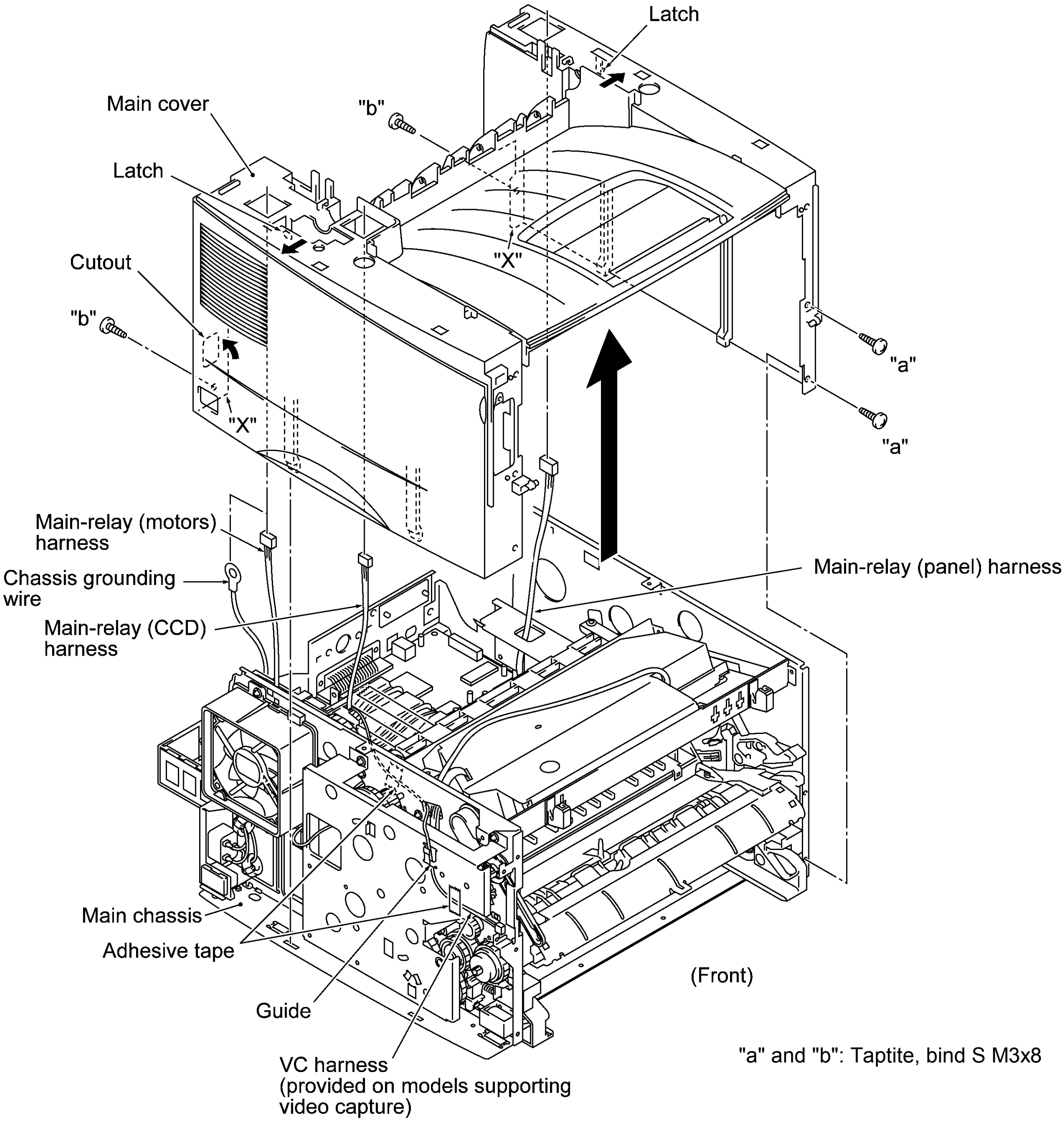


1.15 Main Cover

(1) Remove two screws "a" from the front side of the main cover.

(2) Remove two screws "b" from the rear side of the main cover, and then pull corner edges "X" outwards to dislocate the main cover from the main chassis. Make sure that the cutout provided in the main cover is dislocated from the power inlet.

(3) Unhook the two latches with the tip of a flat screwdriver, then lift up the main cover.

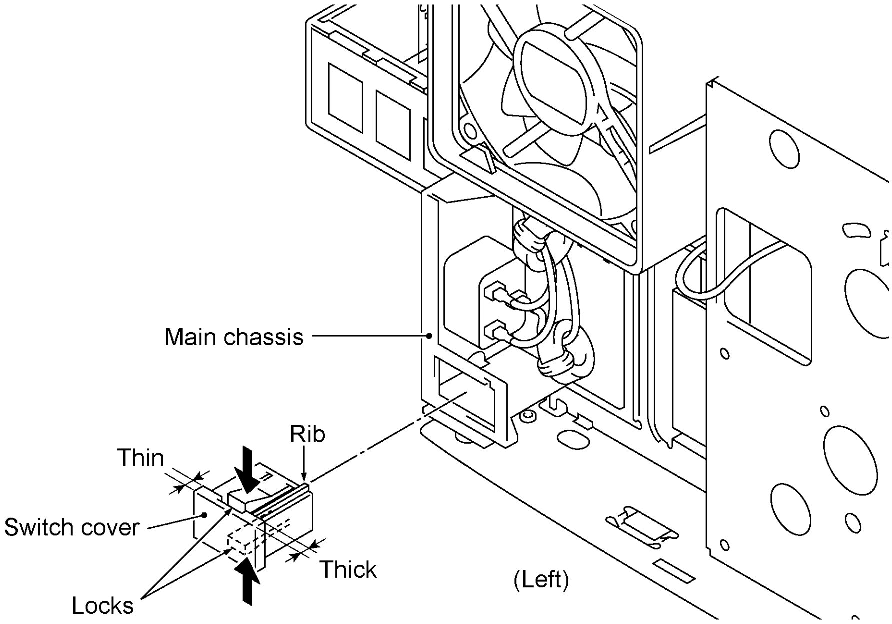


■ Reassembling Notes

- When reinstalling the main cover, route the main-relay (panel) harness, main-relay (CCD) harness, and main-relay (motors) harness through the respective cutouts provided in the main cover, as illustrated above.

1.16 Switch Cover (for models not equipped with a power switch)

(1) Push the locks of the switch cover as shown below and remove it.



1.17 Laser Unit

(1) Remove screw "a" and take off the harness cover.

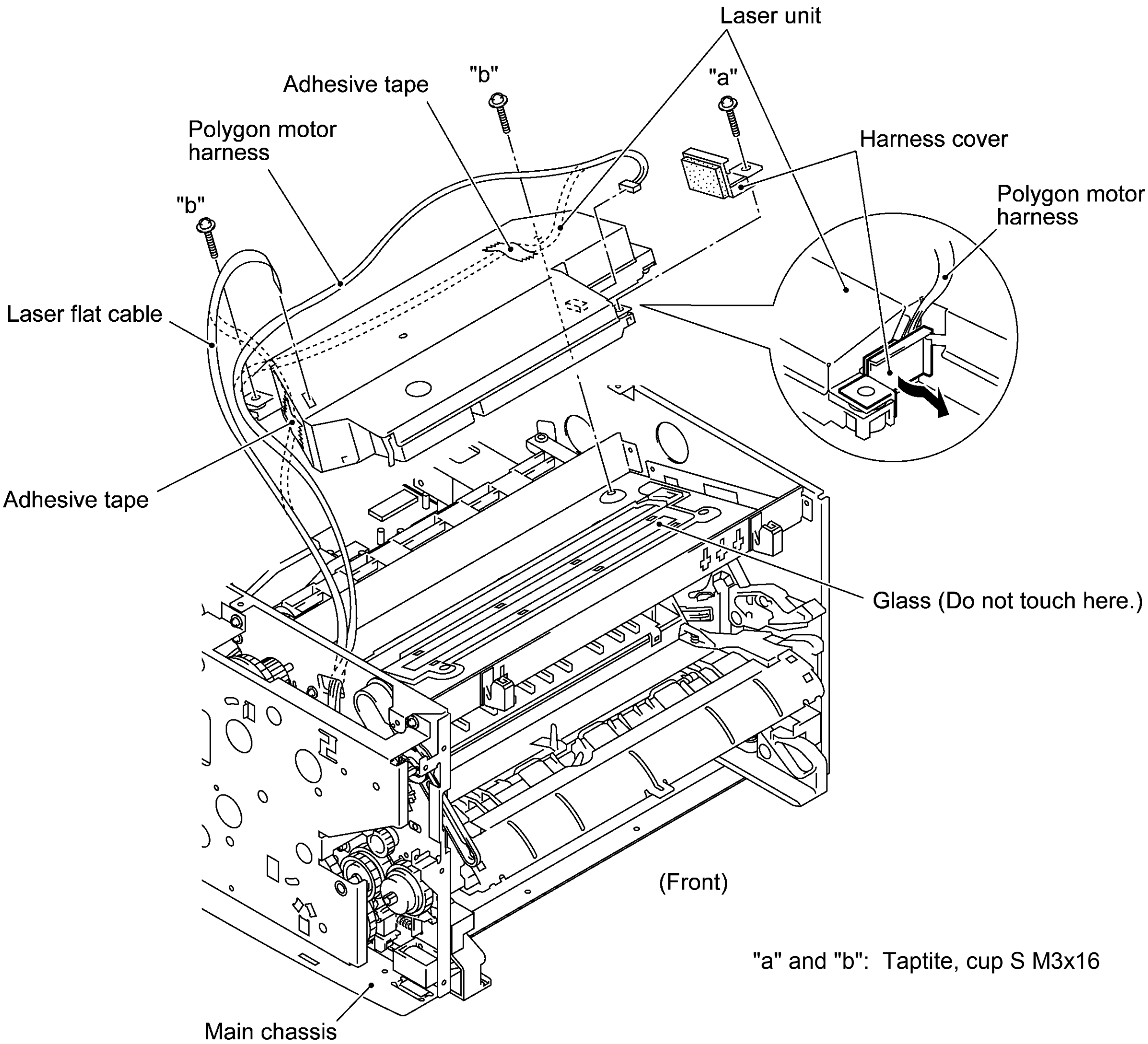
(2) Remove two screws "b."

(3) Disconnect the polygon motor harness and laser flat cable from the laser unit.

(4) Lift up the laser unit.

NOTE: When handling the laser unit, take care not to touch the inside of the unit, glass, or mirror.

NOTE: On the small PCB in the laser unit is a 2-pin connector which is for the adjustment in the factory. Do not disturb it.



■ **Reassembling Notes**

- Before putting the laser unit back into place, check for any toner particles, paper dust or dirt, and clean them out.
- After routing the polygon motor harness and laser flat cable, tape them onto the laser unit as shown above.

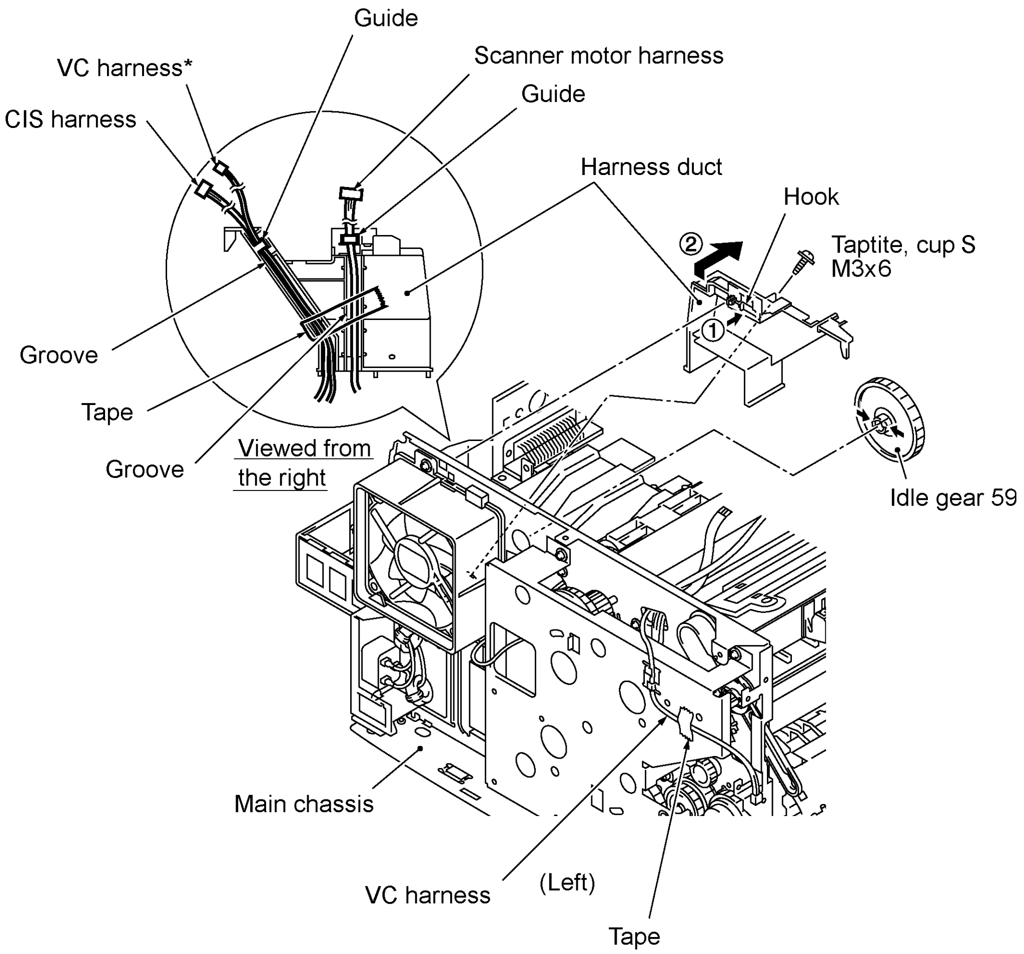
1.18 Heat-fixing Unit and FU Lamp

(1) Remove the screw from the harness duct.

(2) Peel off tape and take off the scanner motor harness, CIS harness, and VC harness* from the harness duct.

(3) Unhook the harness duct from the main chassis in the directions of arrows ① and ②.

*Provided on models supporting video capture

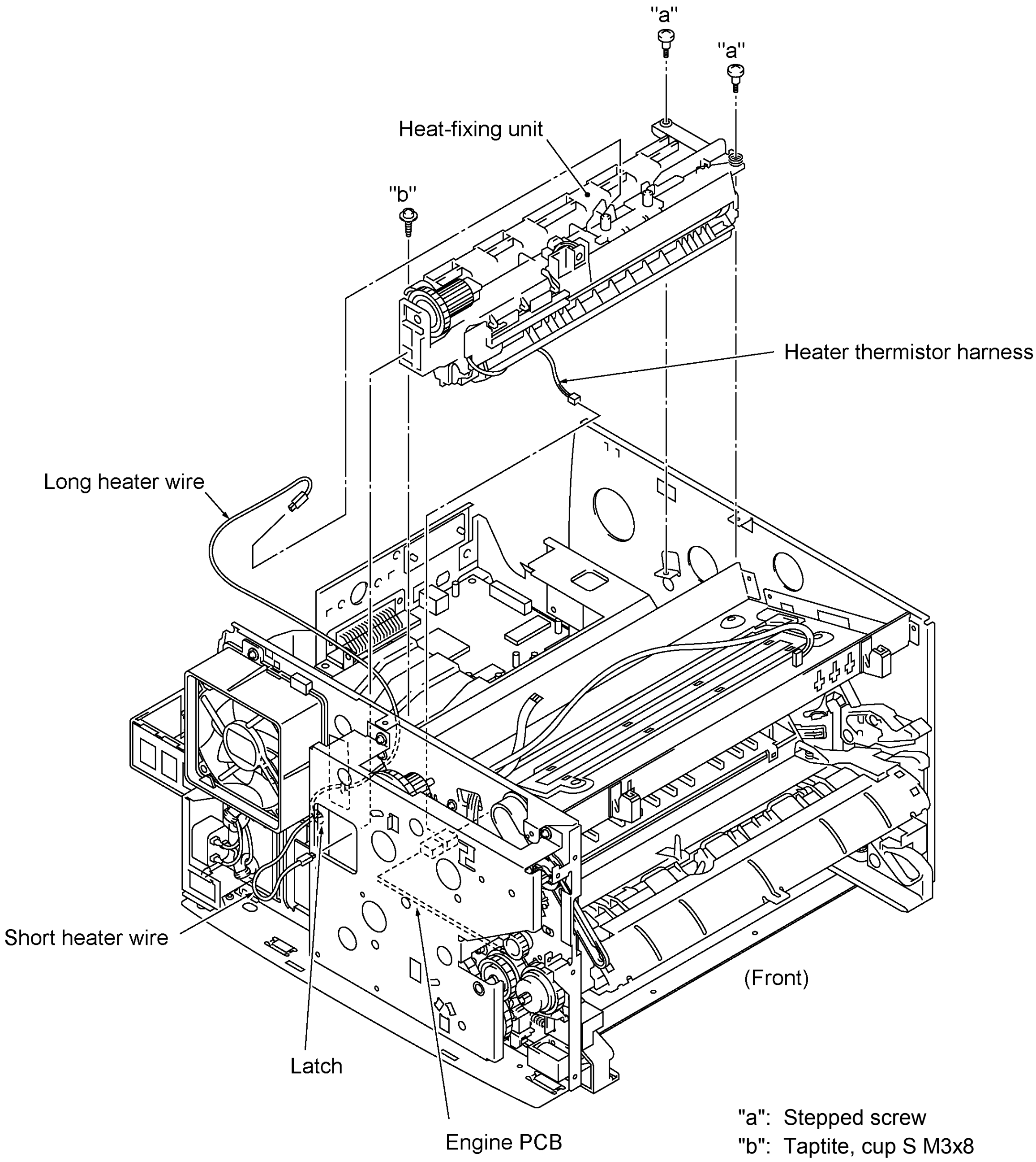


(4) Remove three screws (two "a" and one "b").

(5) Disconnect the long heater wire (of the heater harness) from the upper center of the heat-fixing unit.

(6) Disconnect the short heater wire (of the heater harness) from the left end of the heat-fixing unit.

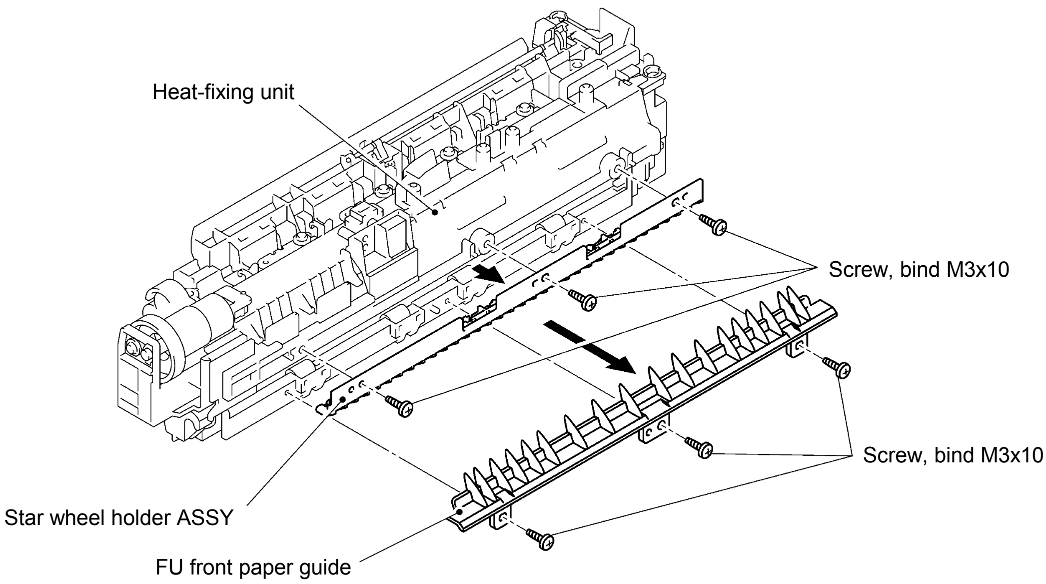
(7) Lift up the heat-fixing unit and disconnect the heater thermistor harness from the engine PCB.



[Disassembling the heat-fixing unit]

(1) Remove the three screws and take off the FU front paper guide.

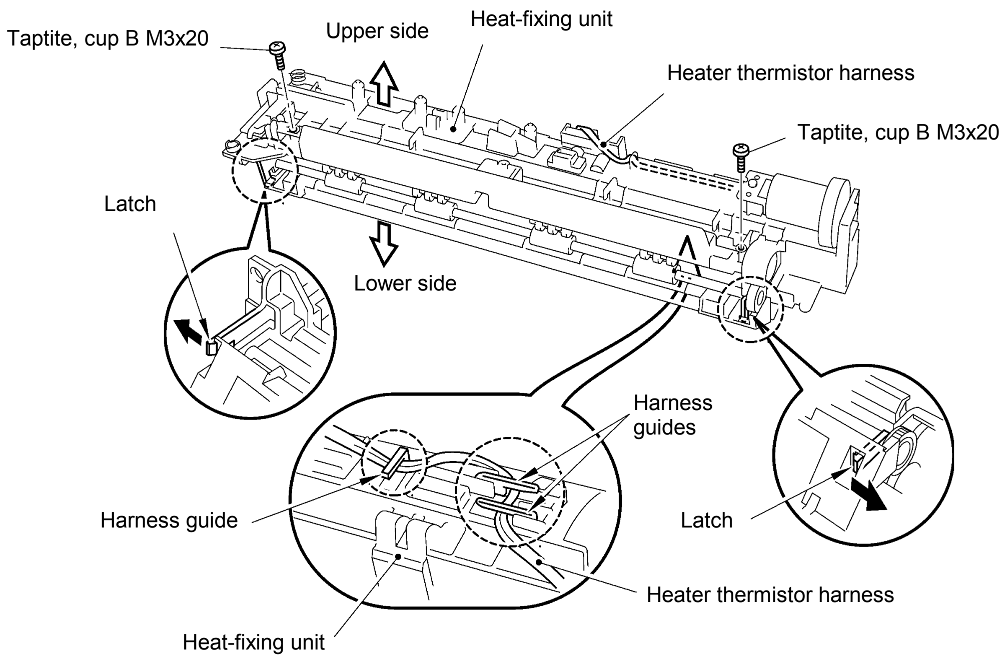
(2) Remove the three screws and take off the star wheel holder ASSY.



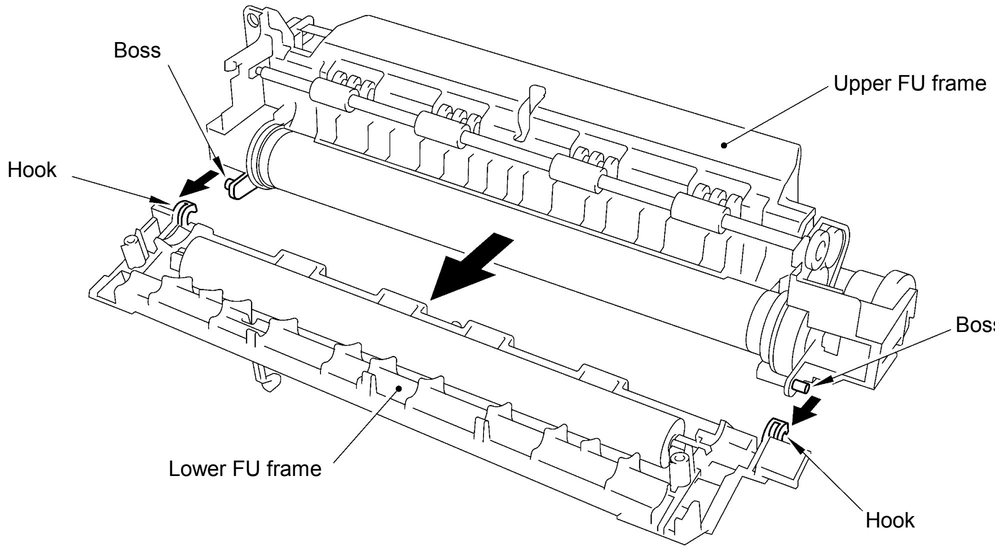
(3) Release the heater thermistor harness from the three harness guides provided on the underside of the heat-fixing unit.

(4) Remove the two screws from the top of the heat-fixing unit.

(5) Unlatch the upper FU frame from the lower one at each of the right and left ends.



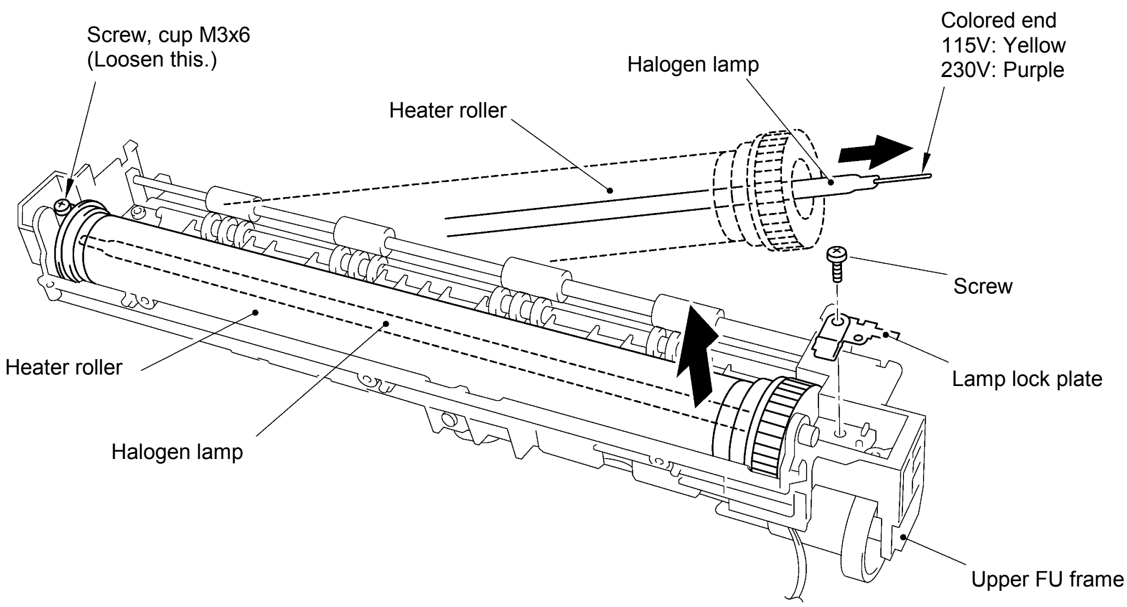
(6) Separate the lower FU frame from the upper one.



(7) Remove the screw securing the lamp lock plate at the gear side of the upper FU frame. At the other side, loosen the screw.

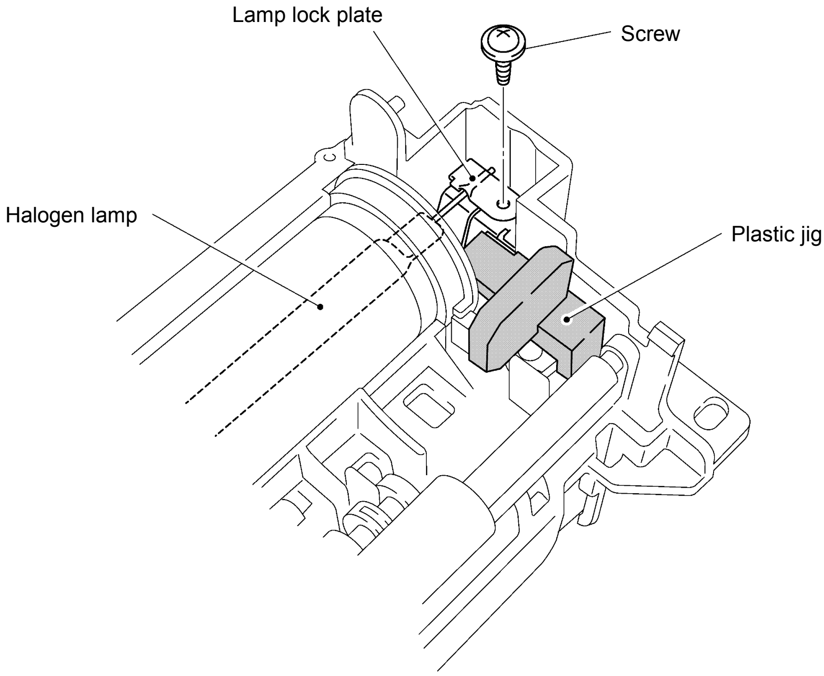
(8) Slightly lift up the right-hand end of the heater roller and pull out the halogen lamp from the heater roller.

CAUTION: Do not touch the surface of the halogen lamp. If you have touched it, clean it thoroughly with alcohol.



NOTE: When setting the halogen lamp into the heat-fixing unit, be careful with the insertion direction as shown above.

CAUTION: When securing the halogen lamp to the lamp lock plate with the screw, be sure to use the plastic jig as shown below to avoid damaging the edge of the halogen lamp with a screwdriver.

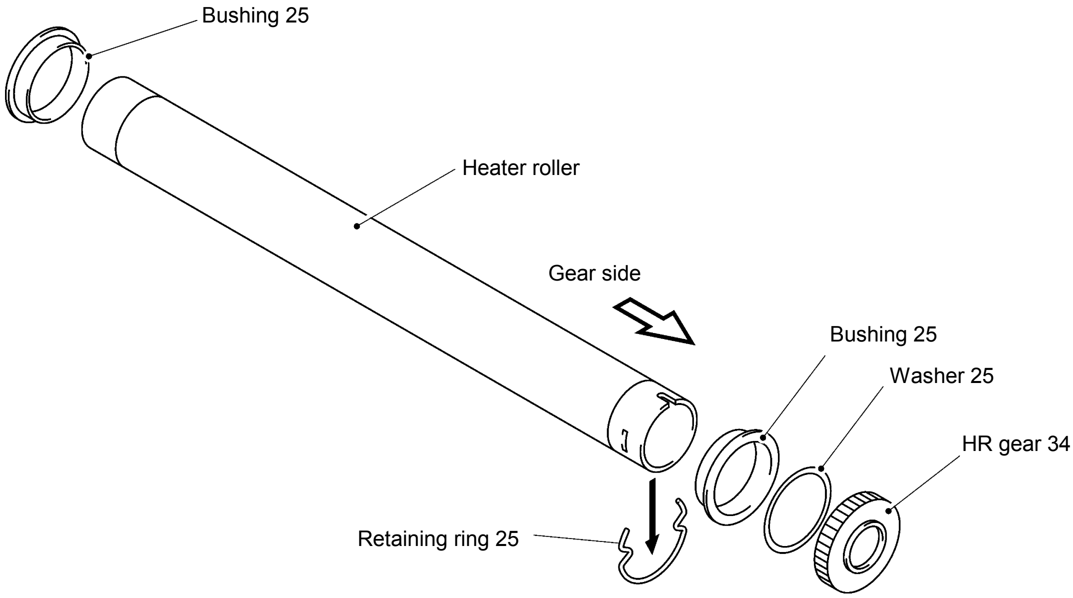


(9) Take the heater roller out of the upper FU frame.

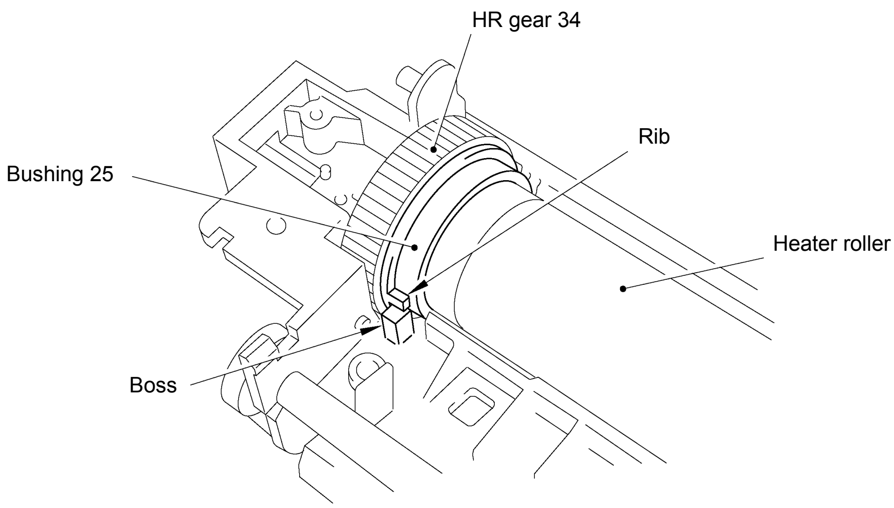
(10) At the gear side of the heater roller, remove the HR gear 34, retaining ring 25, washer 25, and bushing 25 in this order.

At the other end of the heater roller, remove the bushing 25.

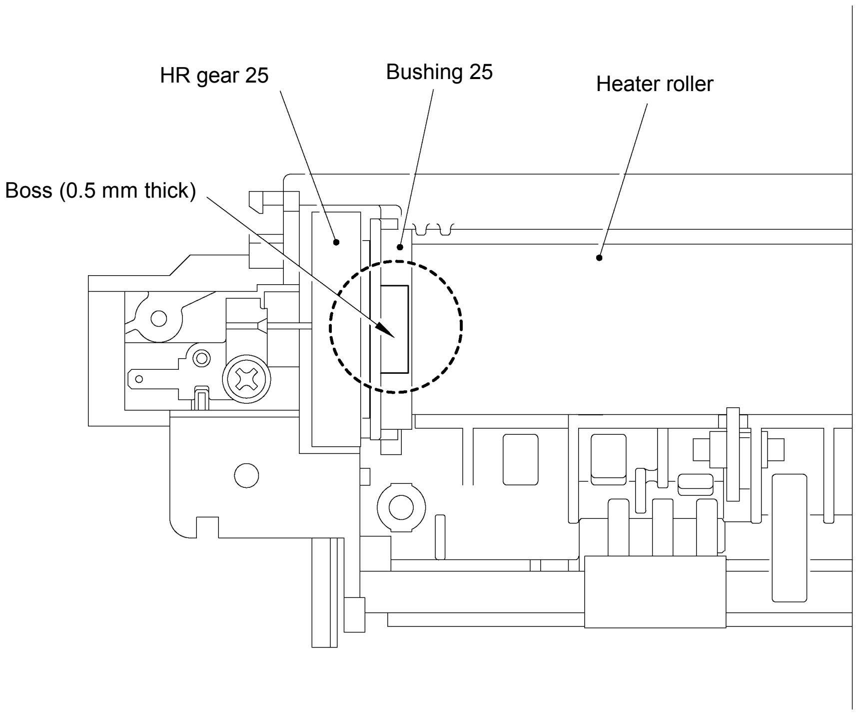
CAUTION: Do not touch the surface of the heater roller. If you have touched it, clean it thoroughly with dry, lint-free cloth.



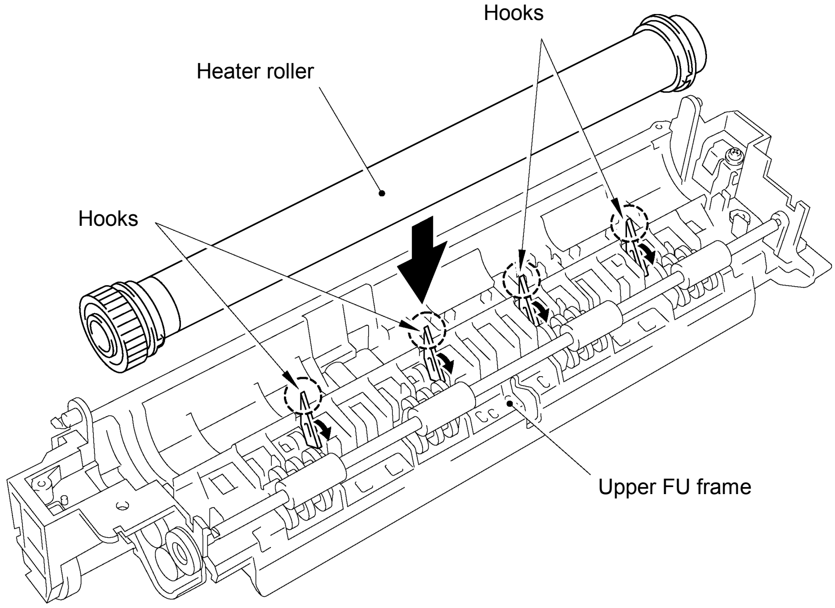
NOTE: When setting the heater roller to the upper FU frame, fit the two ribs of the bushing 25 onto the bosses provided on the FU frame as shown below.



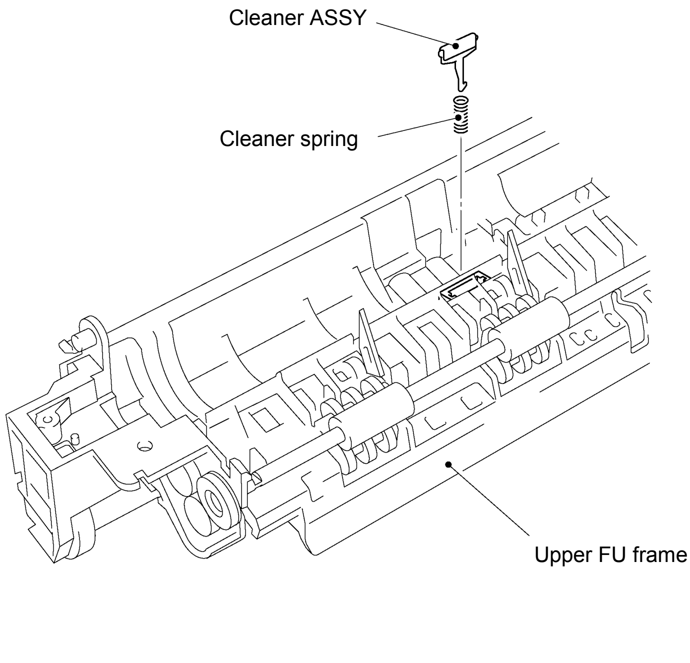
NOTE: At the gear side of the heater roller, fit the bushing 25 onto the heater roller with the 0.5 mm thick boss facing up.



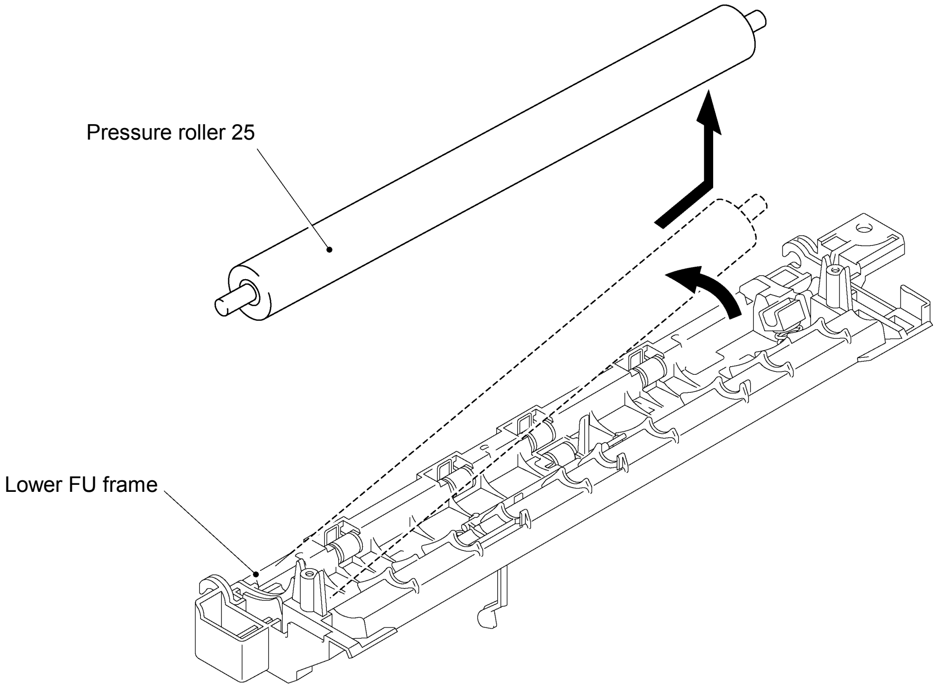
NOTE: When setting the heater roller into the upper FU frame, take care not to damage the heater roller with the four hooks.



(11) Remove the cleaner ASSY and cleaner spring from the upper FU frame.



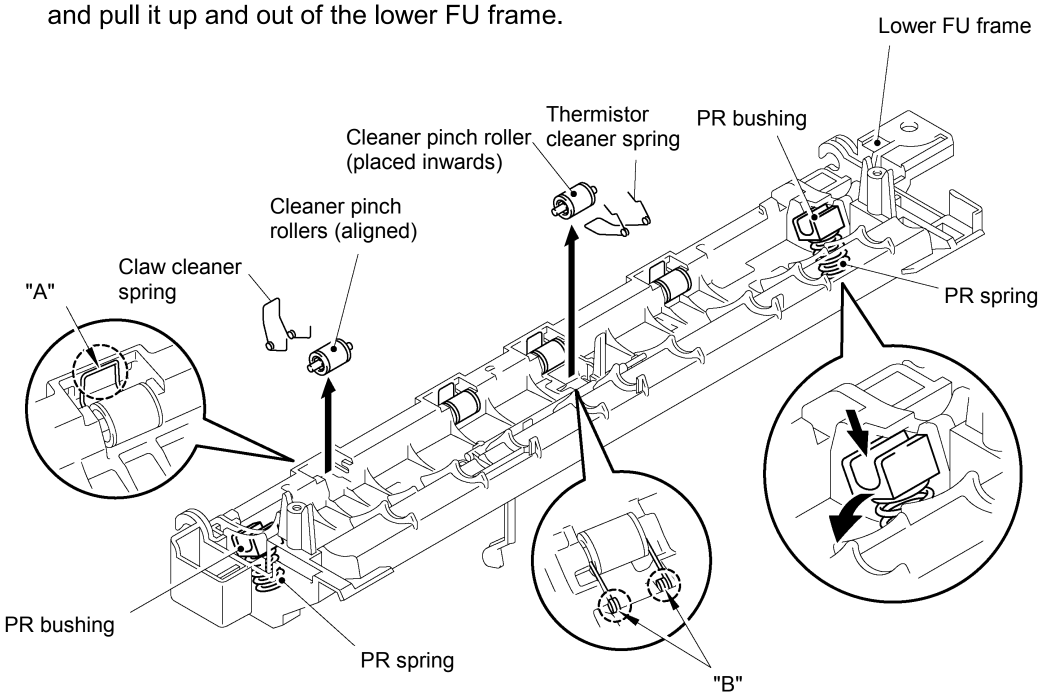
(12) From the lower FU frame, gently lift up the right end of the pressure roller 25 and remove it.



(13) At each of the right and left ends of the lower FU frame, push down the PR bushing to incline it inwards and take it out. Remove the PR springs also.

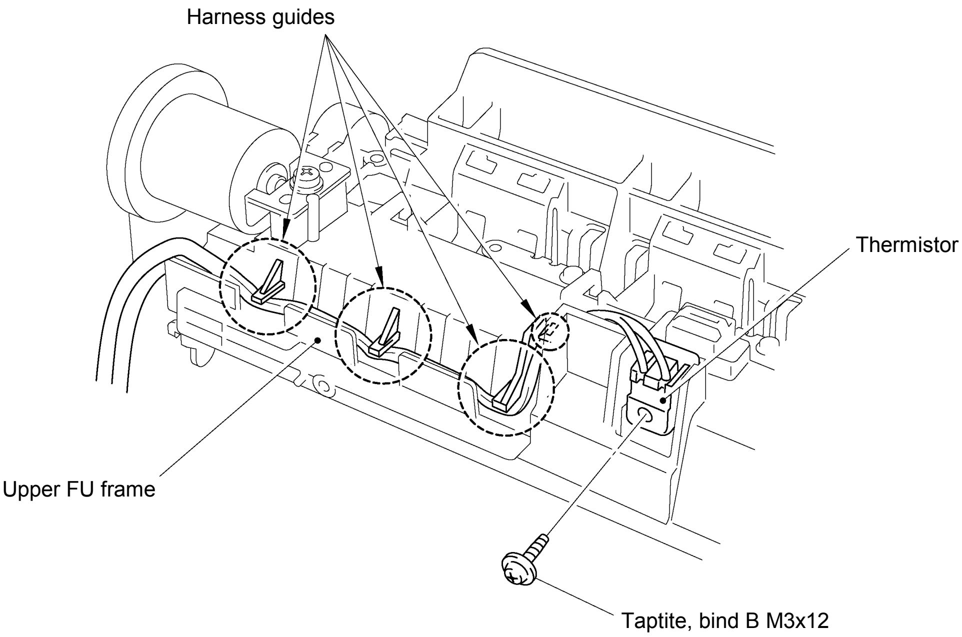
(14) At each of the four aligned cleaner pinch rollers, pinch section "A" of the claw cleaner spring and pull it up and out of the lower FU frame. Then remove those four cleaner pinch rollers.

(15) At the cleaner pinch roller placed inwards, pinch section "B" of the thermistor cleaner spring and pull it up and out of the lower FU frame.

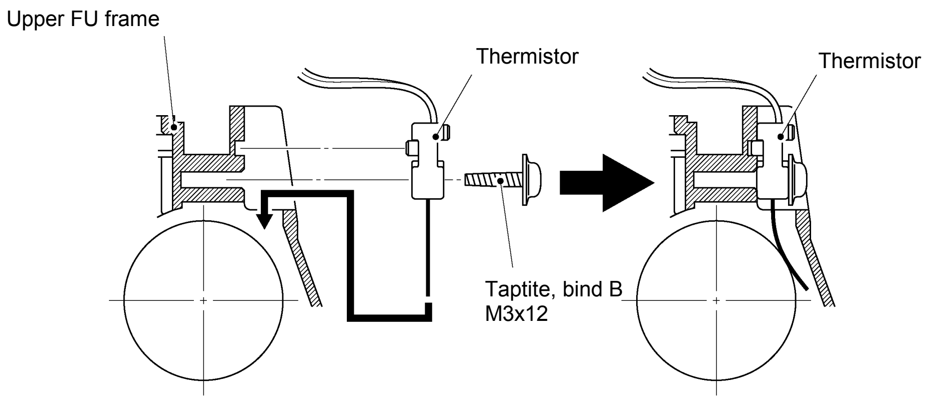


NOTE: When setting claw cleaner springs and thermistor cleaner spring into the lower FU frame, fully push them in so that sections A and B will not protrude from the frame.

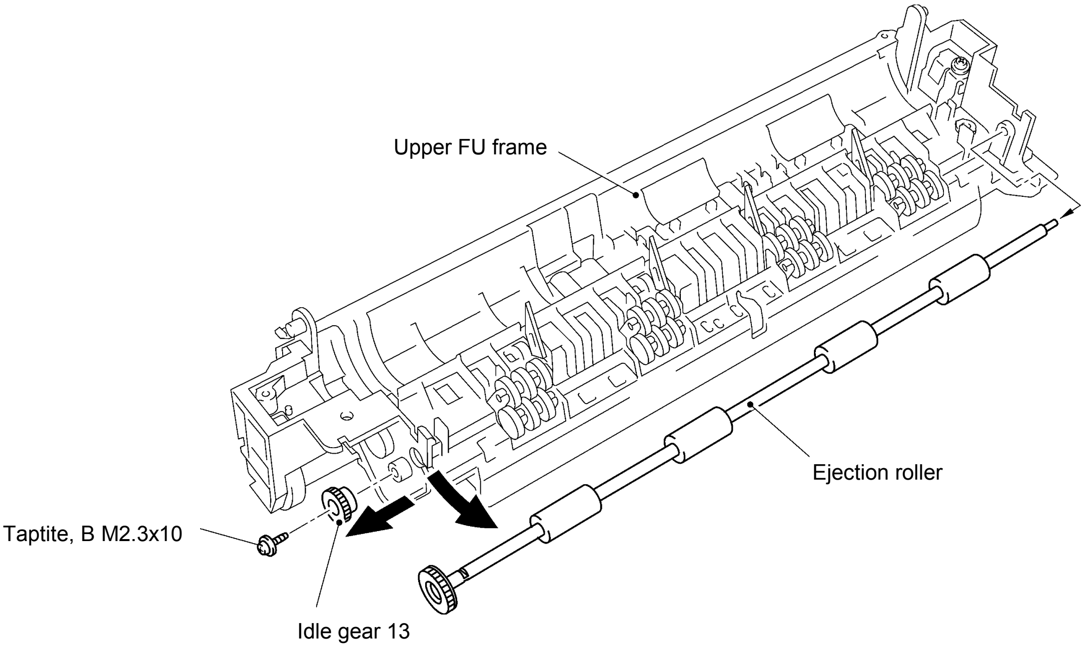
(16) Release the heater thermistor harness from the harness guides provided on the upper FU frame. Then remove the screw and take off the thermistor.



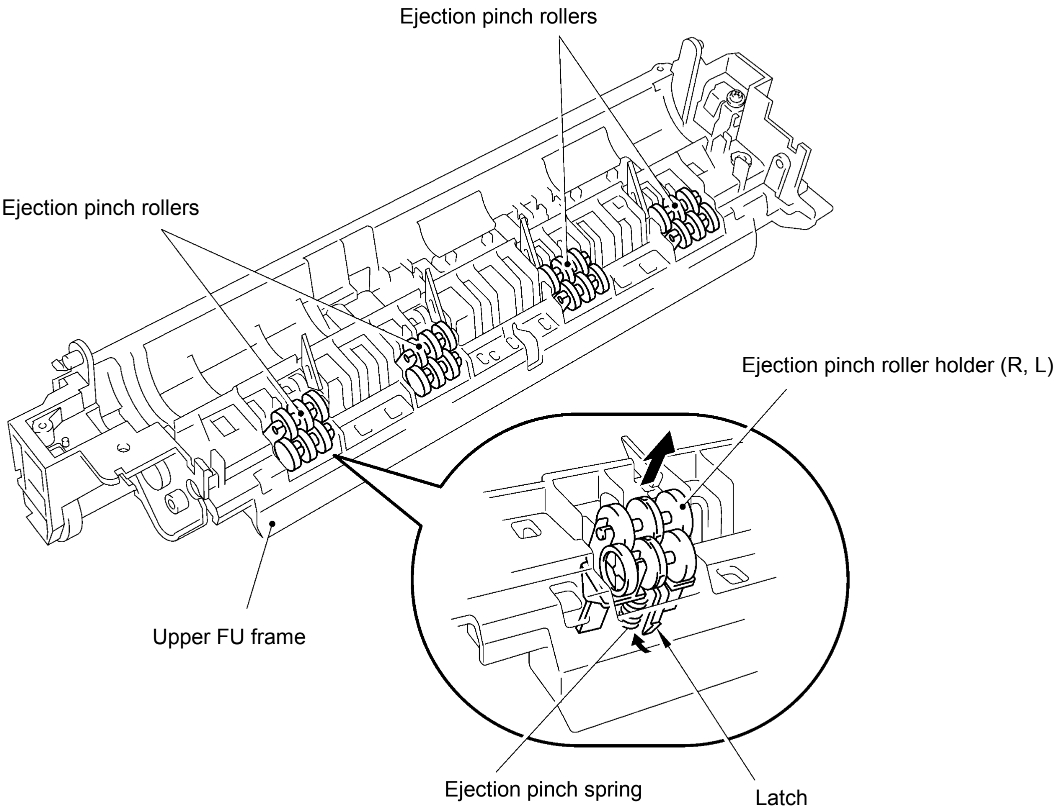
NOTE: When setting the thermistor into the upper FU frame, insert it in the direction shown below.



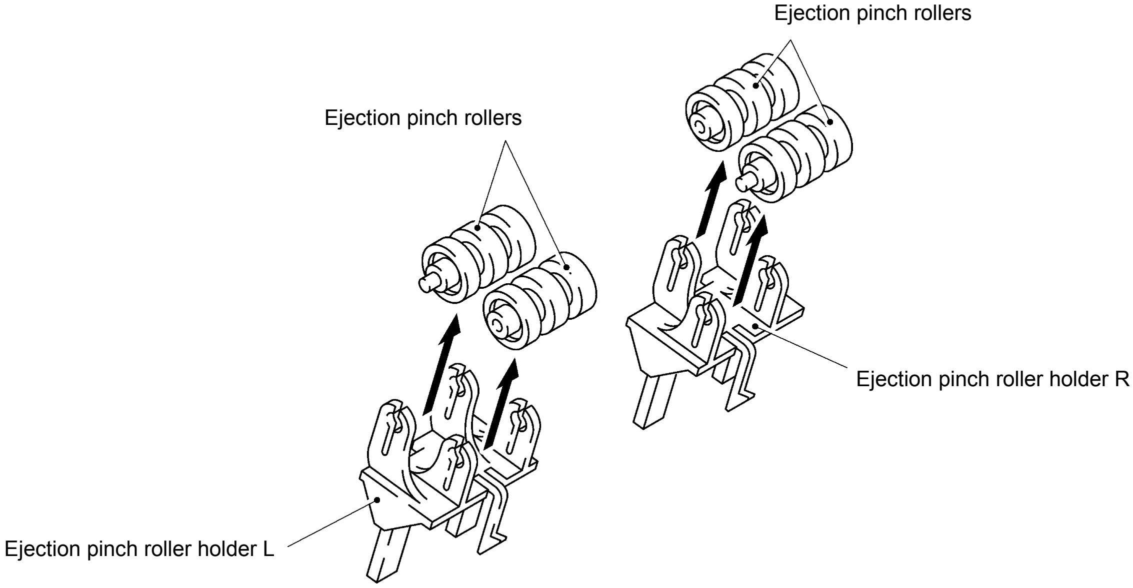
(17) From the upper FU frame, remove the screw and take off the idle gear 13. Then slide the ejection roller to the left and take it out to the front.



(18) Unlatch each of the four ejection pinch roller holders R and L from the upper FU frame and take it out. Remove the ejection pinch spring from each of those holders.

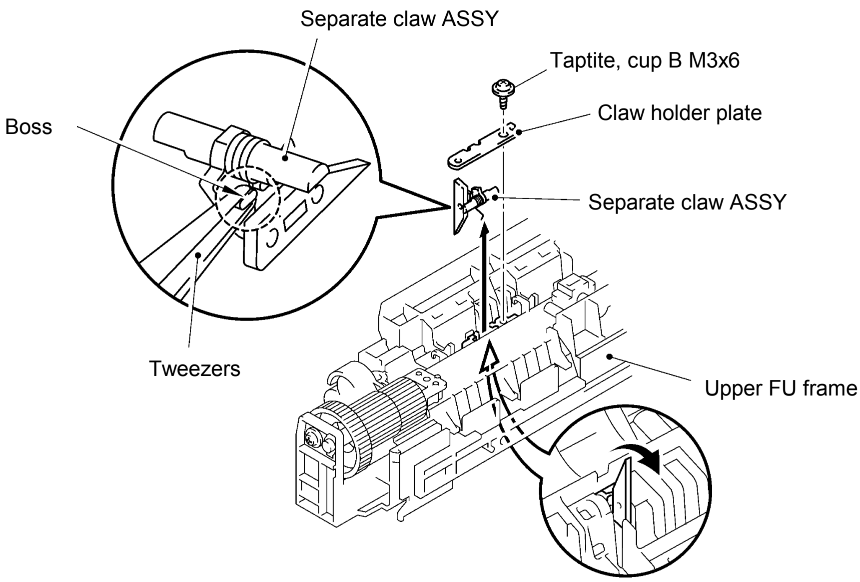


(19) Remove a pair of ejection pinch rollers from each of the ejection pinch roller holders R and L.

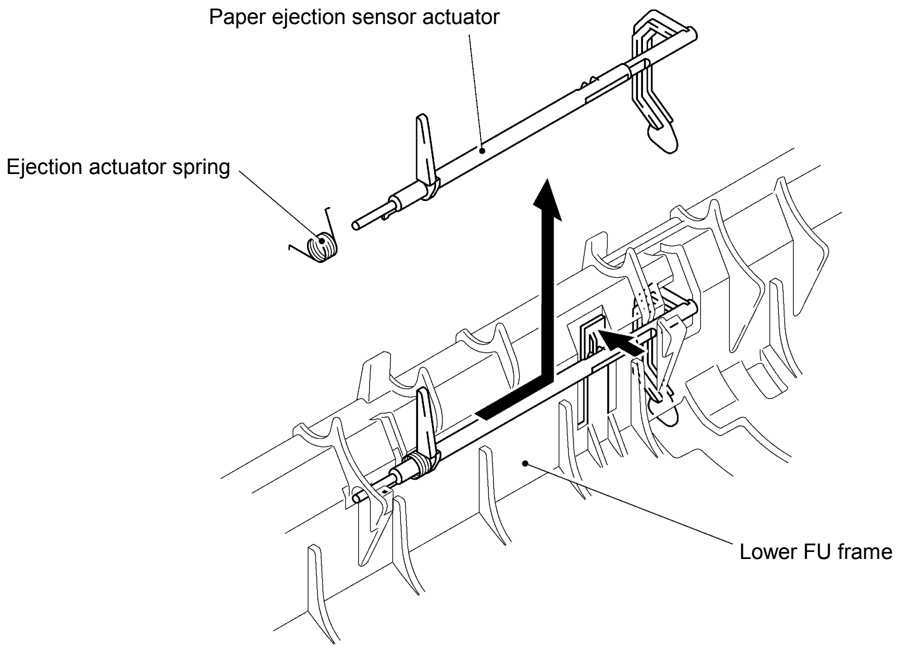


(20) Remove the screw from each of the four claw holder plates and take them off.

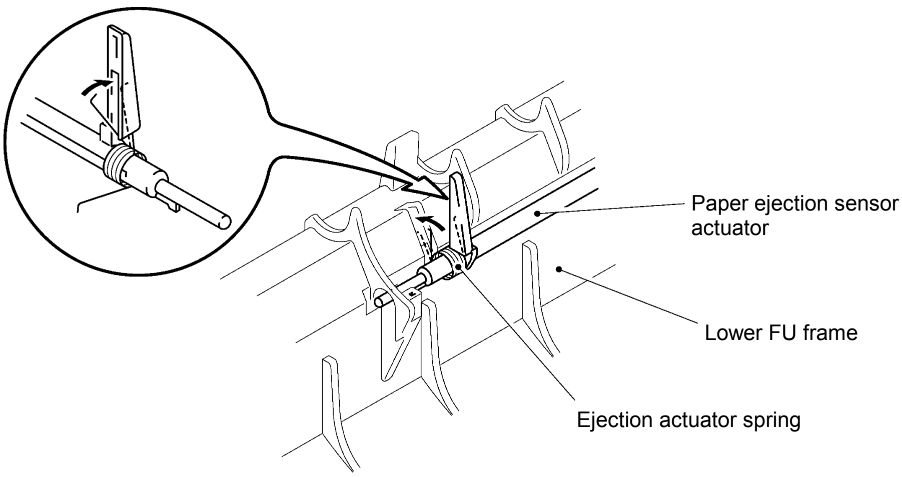
Next turn each of the separate claw ASSYes from the bottom to align its cutout with the opening provided in the upper FU frame. Pinch the boss of the separate claw ASSY with tweezers and take it up.



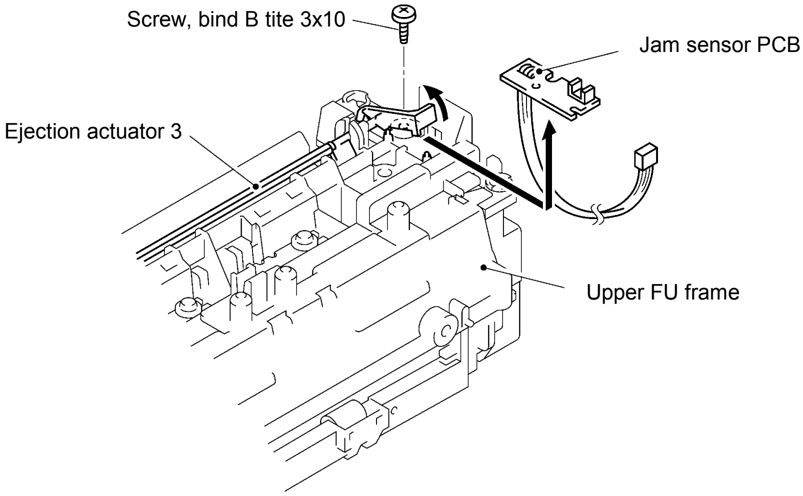
(21) Release the paper ejection sensor actuator from the hook on the lower FU frame and then remove it in the direction of the arrow shown below together with the ejection actuator spring.



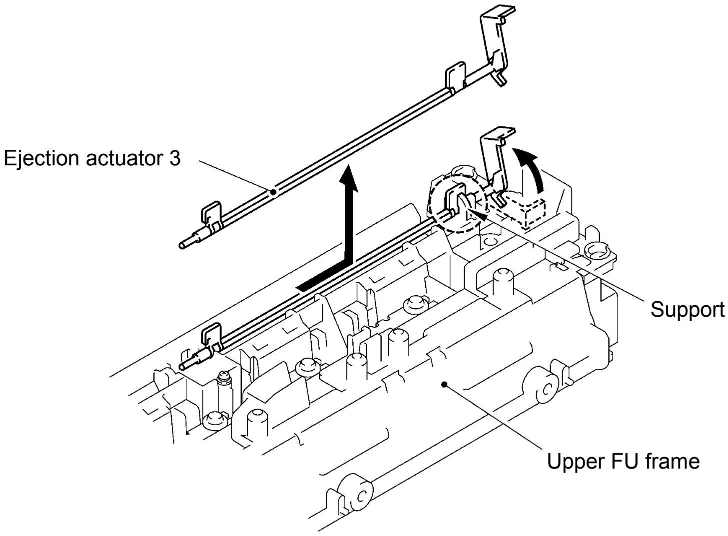
NOTE: When setting the paper ejection sensor actuator and its spring, make sure that they are fitted into place as illustrated below.



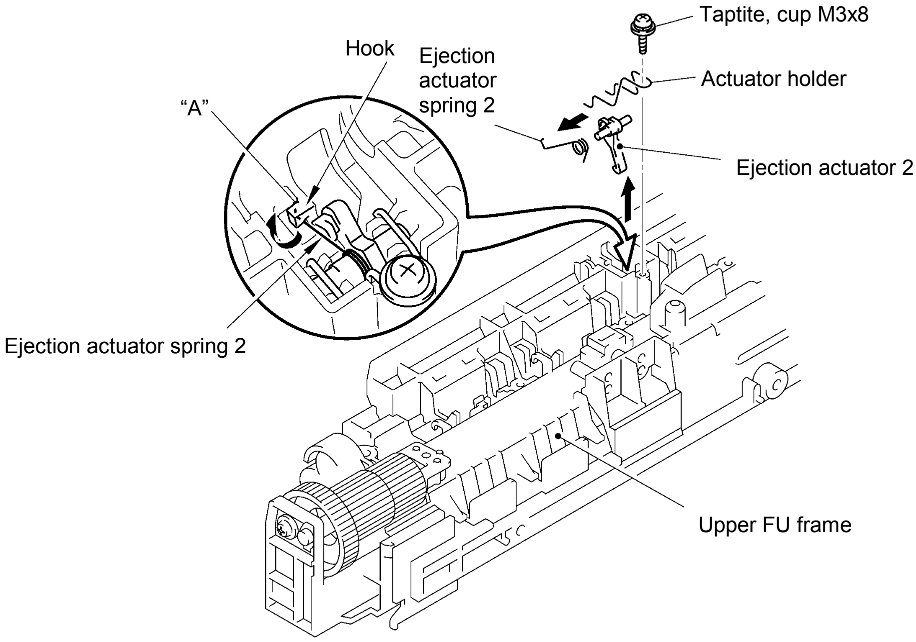
(22) From the upper FU frame, remove the screw, slightly lift up the shutter of the ejection actuator 3, and remove the jam sensor PCB.



(23) Turn the ejection actuator 3, move it to the right, and lift it up and out of the support.



(24) Remove the screw and take off the actuator holder. Then unhook end "A" of the ejection actuator spring 2 from the upper FU frame and pull up the ejection actuator 2 together with the spring.



■ Reassembling Notes

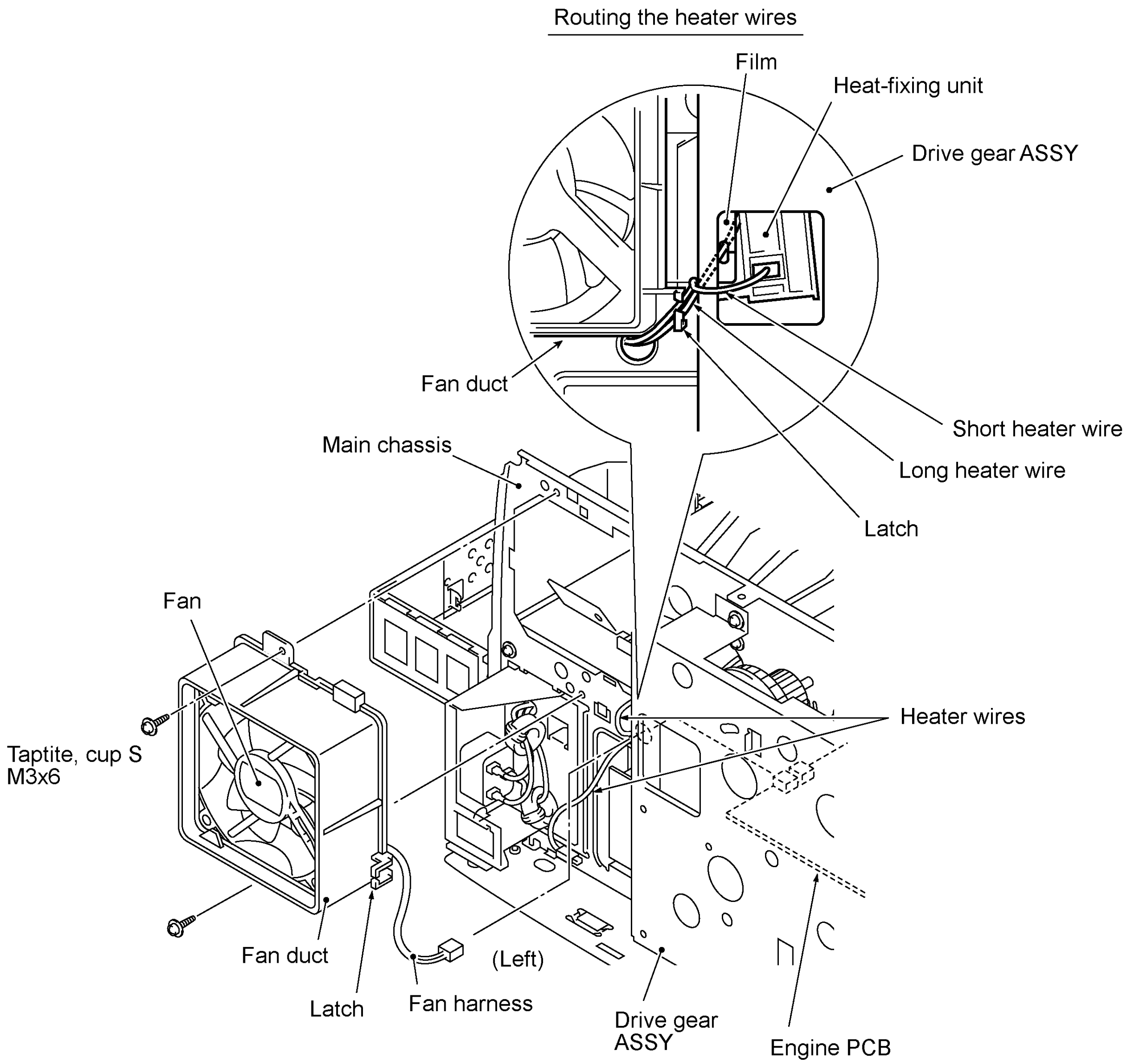
- A new heat-fixing unit will be provided with the heater thermistor harness being taped to the unit. Before installing the unit, remove the tape.
- If you remove and reinstall the heat-fixing unit because of any failure, make the equipment enter the maintenance mode (by pressing the **Menu**, *** 2**, **8**, **6**, and **4** keys) after completion of reassembly and then make it exit from the mode (by pressing the **9** key twice). Otherwise, the heat-fixing unit may not become energized because of the following reason:

  If the failure of the heat-fixing unit is caused by an opening of the thermistor circuit (that senses the temperature of the heat-fixing unit), the system misinterprets the hot heater as being cold. As a result, the temperature of the heat-fixing unit may become excessively high. To prevent the system from heating the hot heater further at the next powering-on, it is designed so that the heater will not be energized. To cancel this setting, you need to carry out the above maintenance-mode procedure.

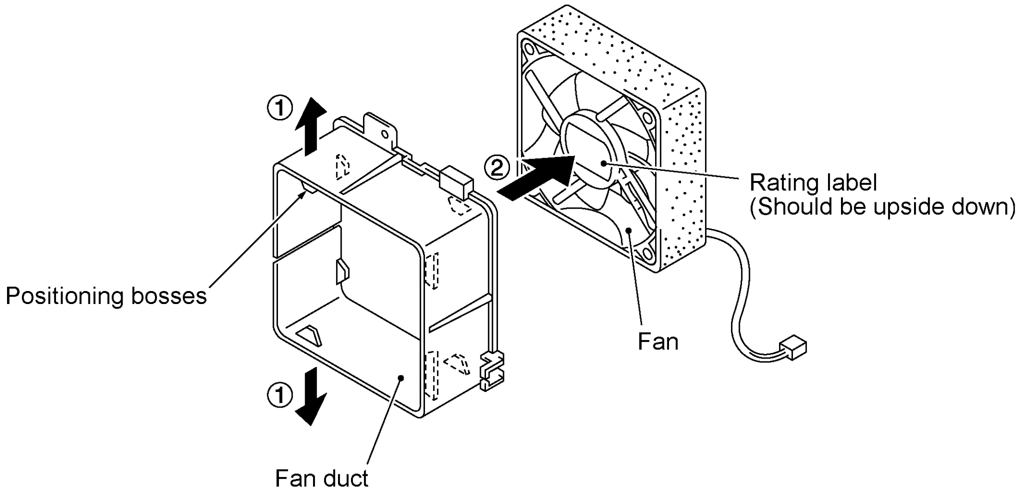
1.19 Fan

(1) Disconnect the fan harness from the engine PCB.

(2) Remove two screws, take out the heater wires from the latch of the fan duct, and take off the fan duct together with the fan.



(3) As shown below, pull the fan duct outwards and take out the fan.



■ Reassembling Notes

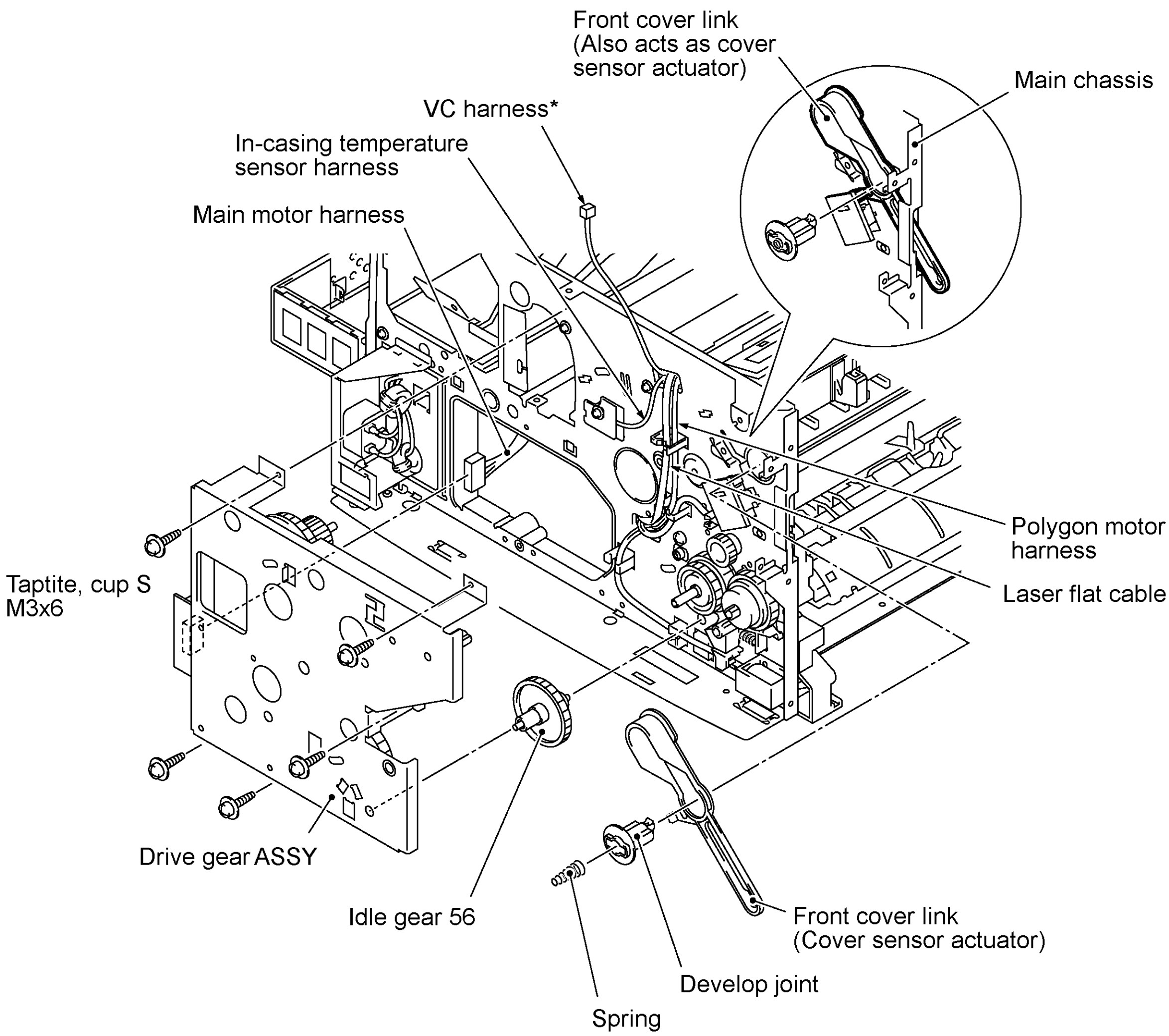
- Put the fan back into place so that the rating label faces outwards and upside down.
- Route the heater wires through the latch of the fan duct as shown on the previous page.

1.20 Drive Gear ASSY and Main Motor ASSY

(1) Remove five screws from the drive gear ASSY.

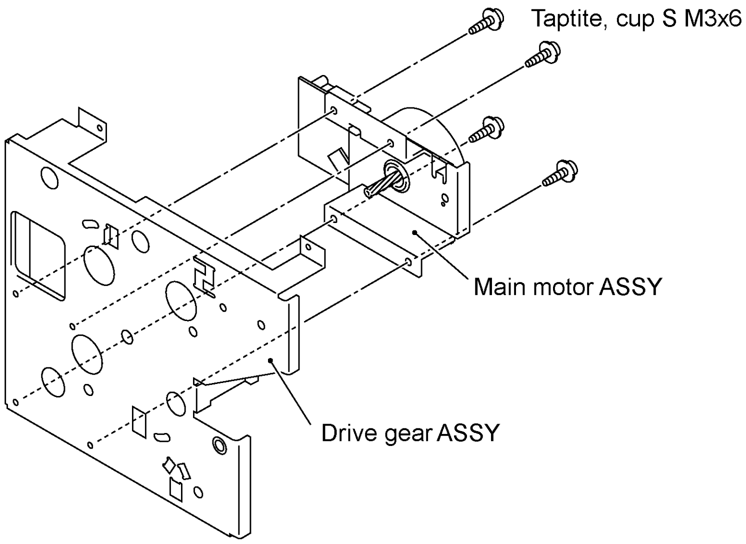
(2) Tilt the drive gear ASSY towards you while taking care not to drop the develop joint and spring, and then disconnect the main motor harness.

(3) Remove the front cover link and idle gear 56 from the main chassis.



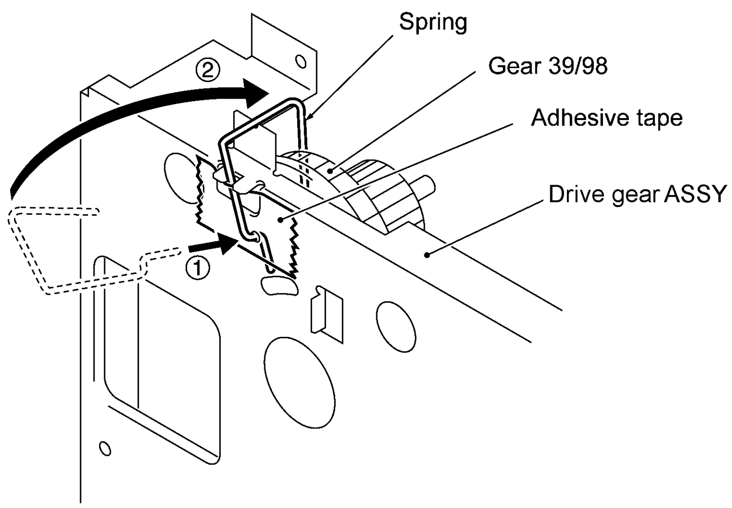
*Provided on models supporting video capture

(4) Remove four screws and take off the main motor ASSY from the drive gear ASSY.



■ Reassembling Notes

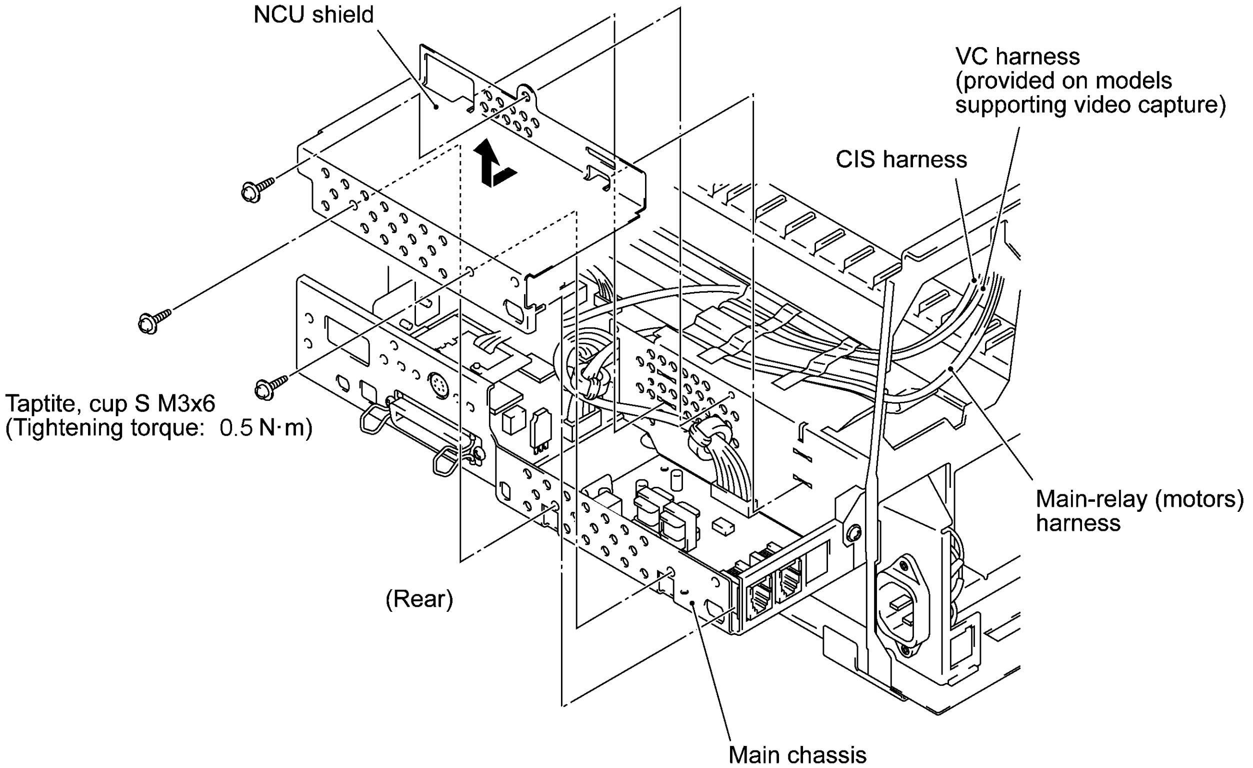
- If you have removed the gear 39/98 from the drive gear ASSY, hook the spring and tape it as shown below.



1.21 NCU Shield and NCU PCB*

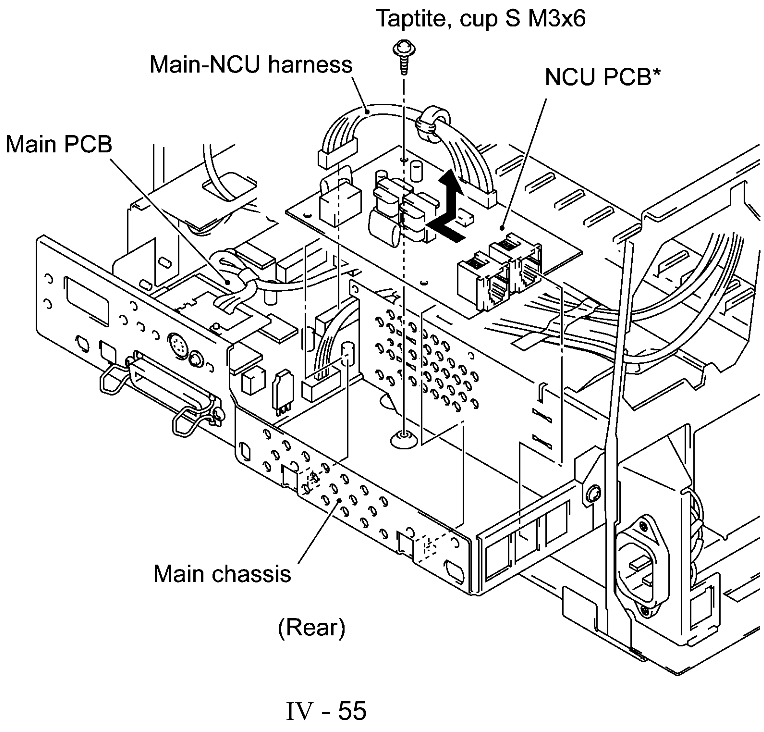
(*Provided on models supporting facsimile function.)

(1) Remove three screws from the NCU shield, then take off the NCU shield.



(2) USA version: Disconnect the main-NCU harness from the main PCB.
European version: Disconnect the main-NCU harness and main-NCU harness 2 from the main PCB. See the illustration given on the next page.

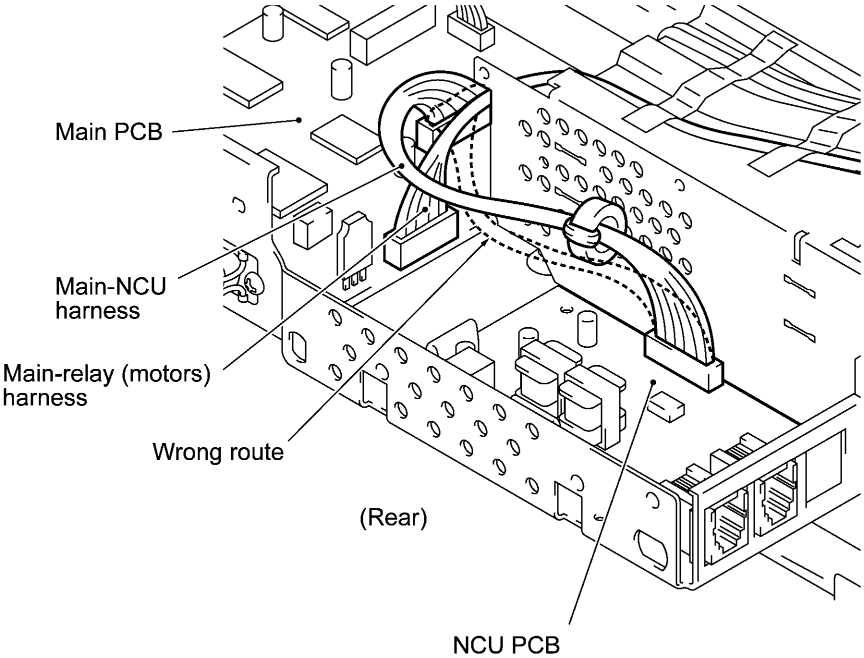
(3) Remove the screw from the NCU PCB and take out the PCB.



■ Reassembling Notes

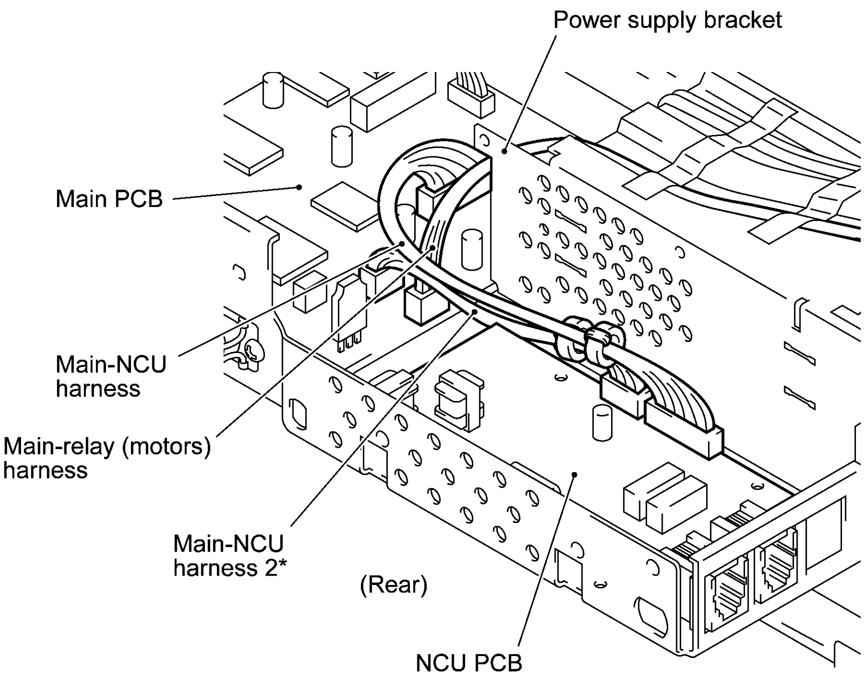
[USA version]

- Route the main-NCU harness above the main-relay (motors) harness as illustrated below.



[European version]

- As illustrated below, route the main-NCU harness and main-NCU harness 2 between the NCU PCB and the power supply bracket to prevent them from interfering with the primary circuitry on the NCU PCB. Then install the NCU shield.

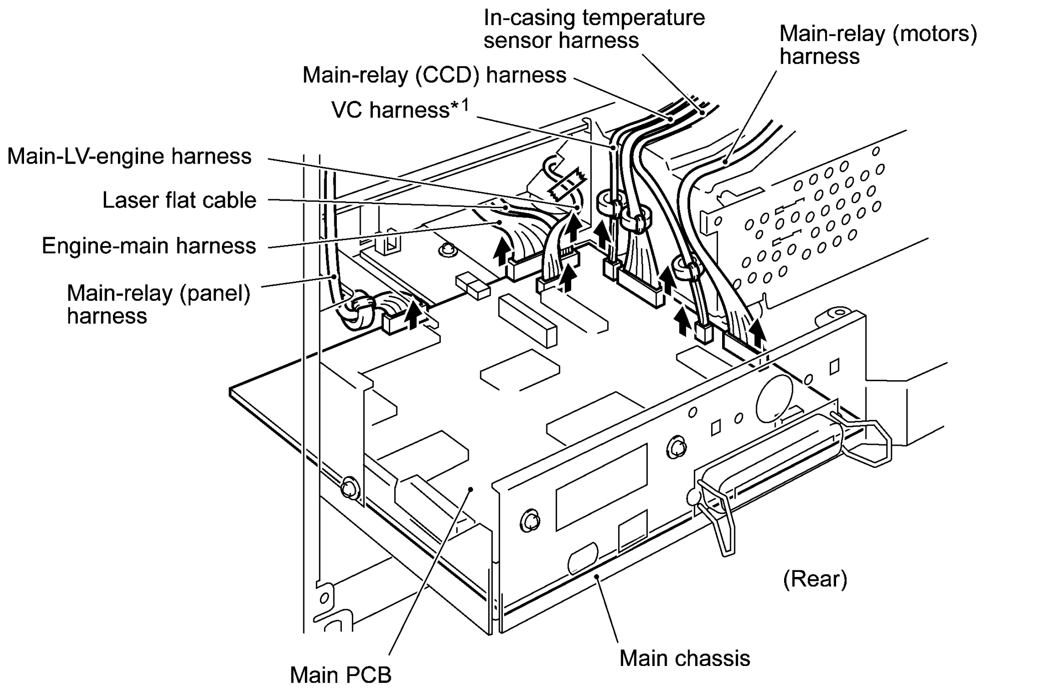


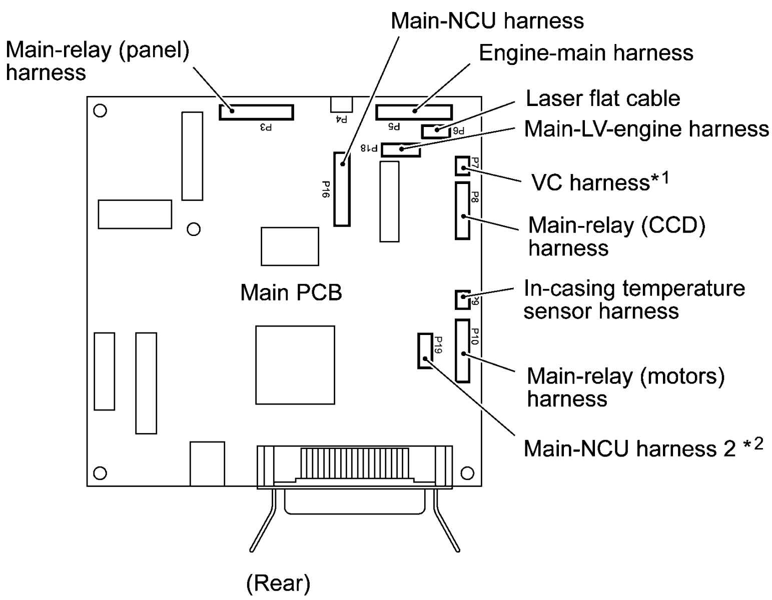
1.22 Bottom Plate, Main PCB, and Bottom Insulation Film

(1) Disconnect the following harnesses and flat cable from the main PCB:

- Main-relay (panel) harness (13-pin, P3)
- Main-LV-engine harness (5-pin, P18)
- Laser flat cable (P6)
- Engine-main harness (12-pin, P5)
- VC harness*[1] (2-pin, P7)
- Main-relay (CCD) harness (12-pin, P8)
- In-casing temperature sensor harness (2-pin, P9)
- Main-relay (motors) harness (11-pin, P10)

*[1] Provided on models supporting video capture
*[2] Provided on the European version





(2) Turn the main chassis upside down.

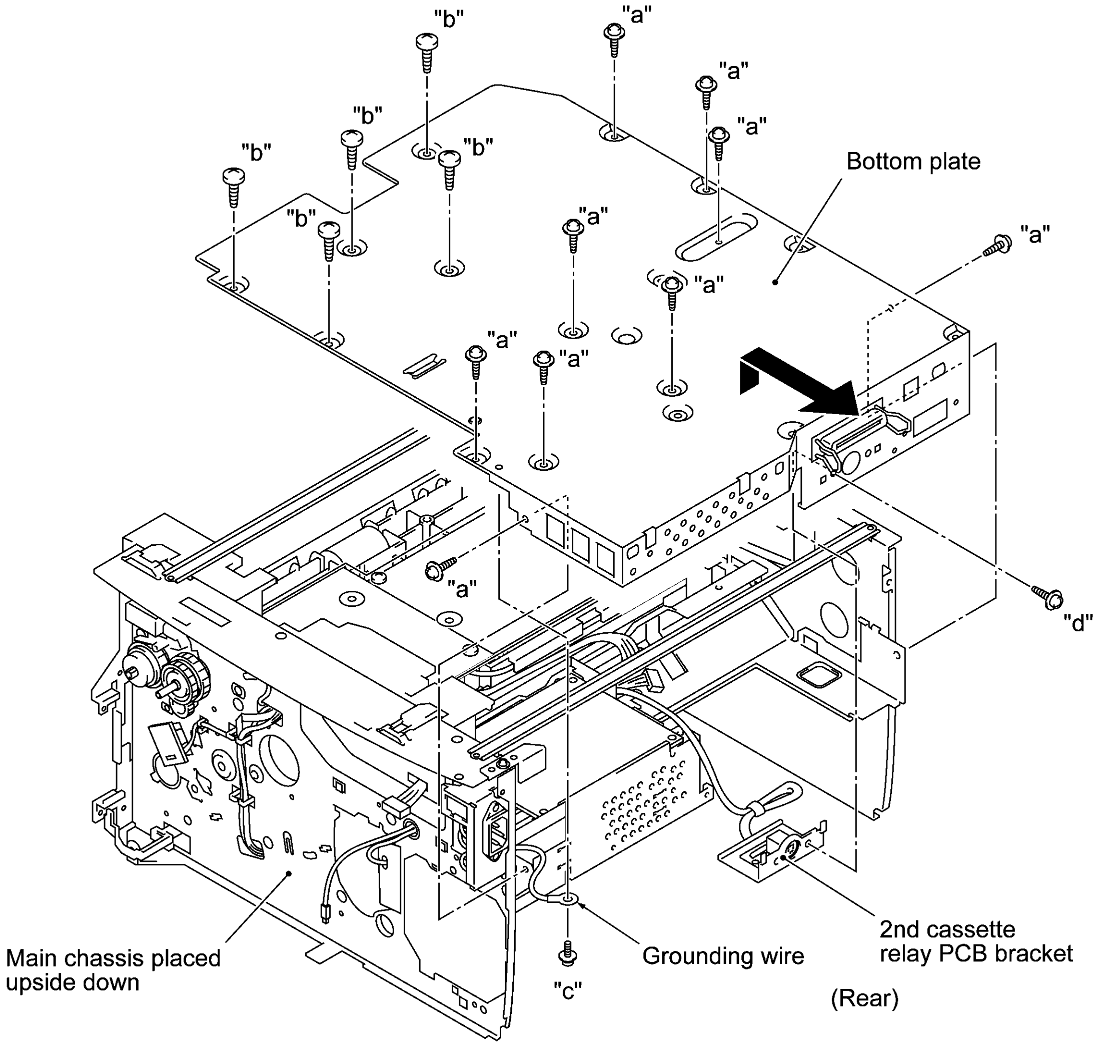
(3) Remove 14 screws (nine "a" and five "b").

(4) Slightly lift up the bottom plate and pull it to the rear until you can remove screw "c."

(5) Remove screw "c" to release the grounding wire.

(6) For models available with a 2nd paper cassette: Remove screw "d" that secures the 2nd cassette relay PCB bracket to the bottom plate.

(7) Pull the bottom plate to the rear and out of the main chassis.

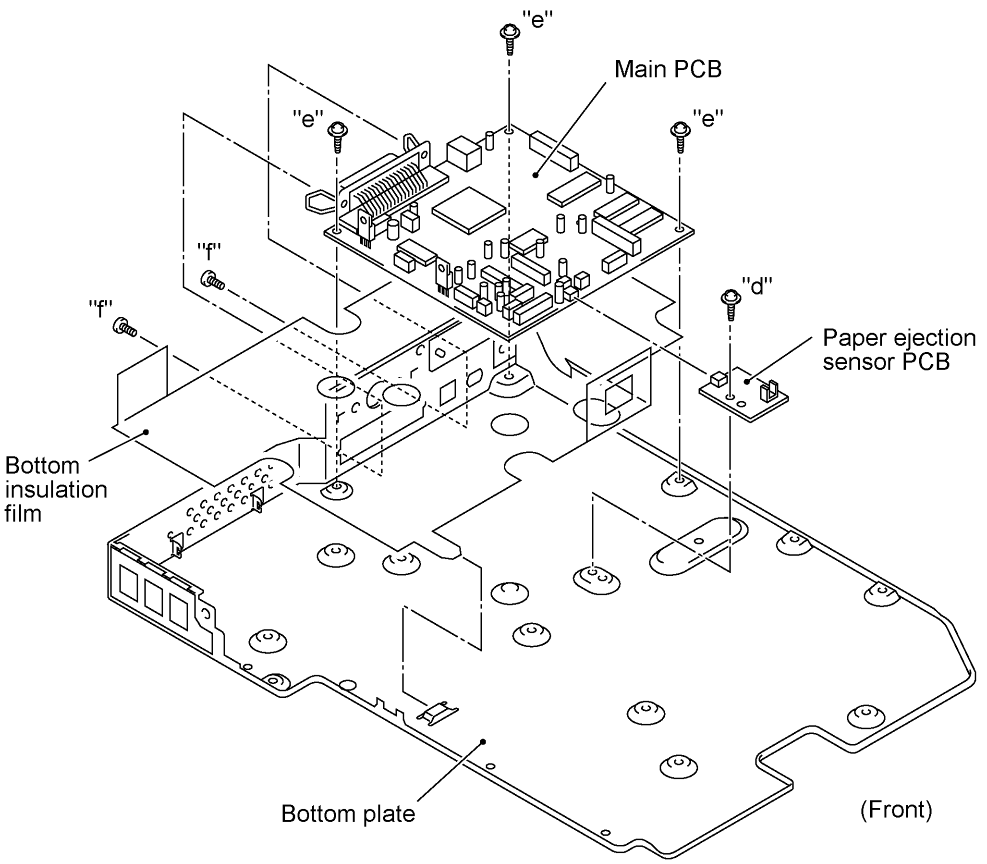


"a" and "d": Taptite, cup S M3x6
"b" Taptite, bind B M4x12
"c": Screw, pan (washer) M3.5x6

(8) Remove screw "d" and disconnect the paper ejection sensor PCB from the main PCB.

(9) Remove five screws (three "e" and two "f"), then take off the main PCB from the bottom plate.

(10) Remove the bottom insulation film.

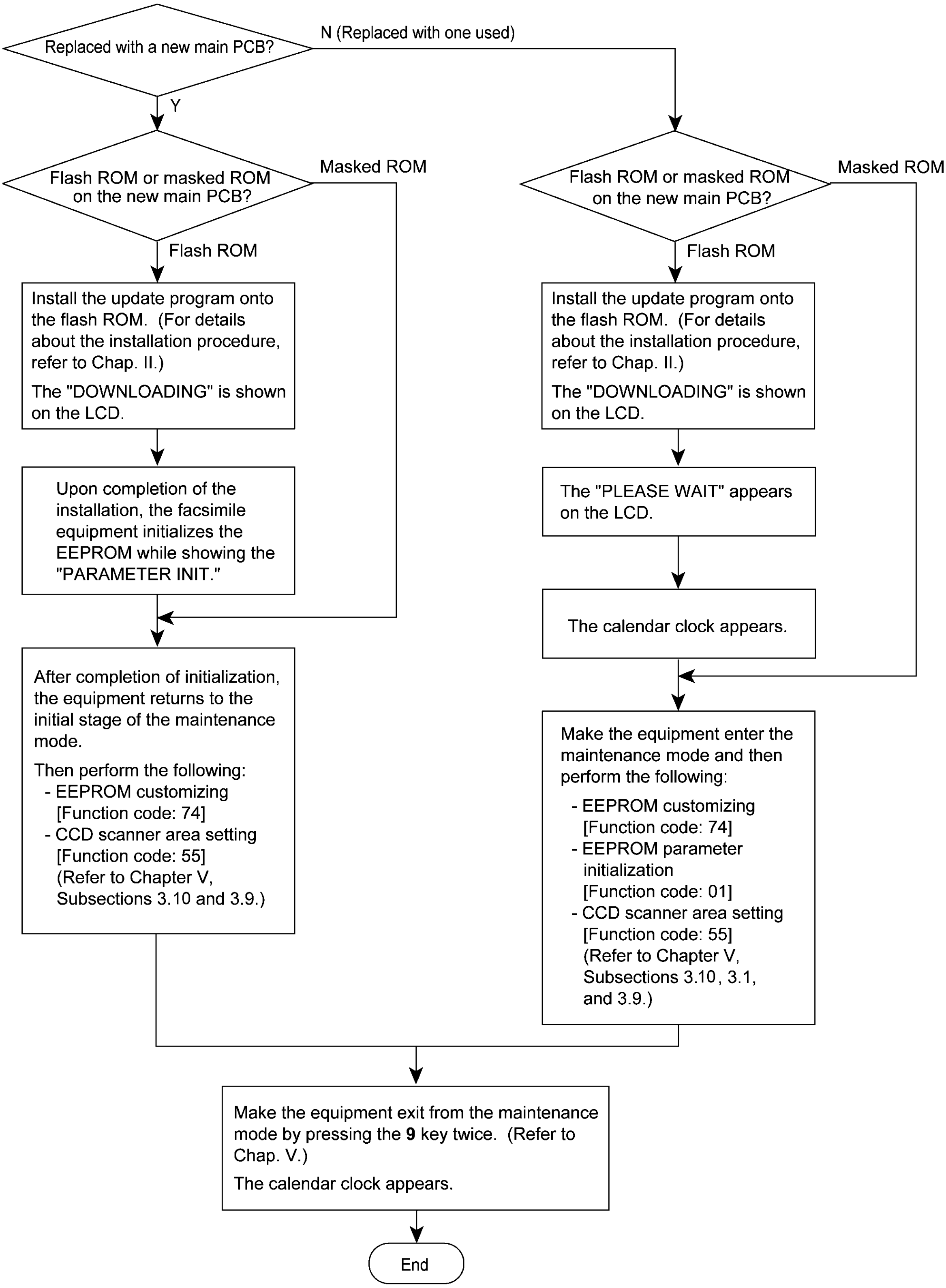


"d" and "e": Taptite, cup S M3x6
"f": Machine screw, pan M3x6

■ Reassembling Notes

- When putting the bottom plate back into place, make sure that the grounding wire is looped and routed through the support film (as illustrated on page IV-61) and then secure the grounding wire to the bottom plate with screw "c" (shown on the previous page).
- After you replace the main PCB, be sure to follow the flowchart given on the next page.

Setting up the main PCB after replacement



1.23 Low-voltage Power Supply PCB and Power Inlet

(1) Remove two screws "g" and take off the rear underbar.

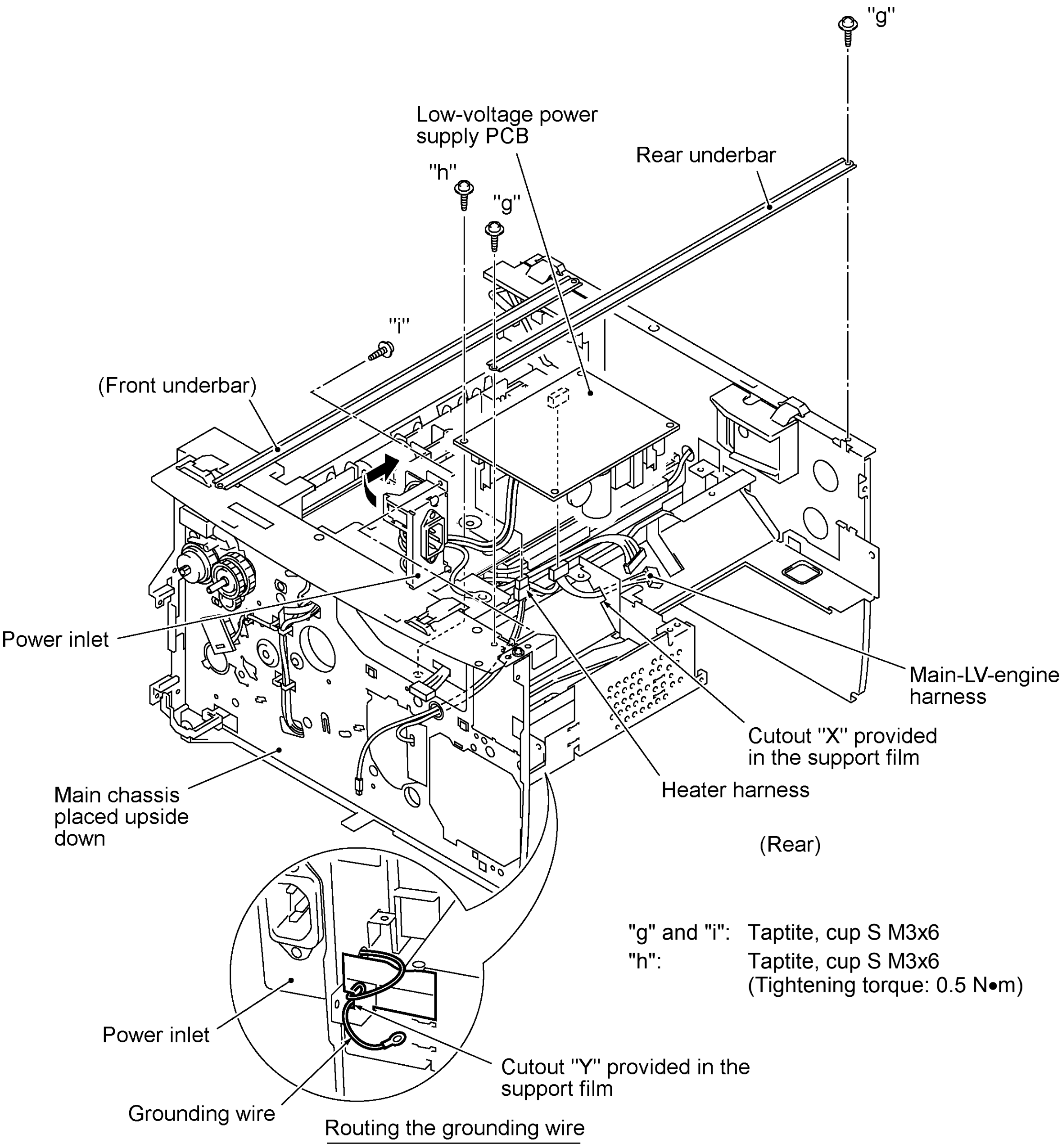
(2) Remove screw "h."

(3) Slightly lift up the low-voltage power supply PCB and disconnect the heater harness and main-LV-engine harness. The low-voltage power supply PCB is connected to the power inlet with soldered lead wires.

(4) Remove screw "i."

(5) While holding up the low-voltage power supply PCB, take out the power inlet from the main chassis to the inside in the direction of the arrow shown below.

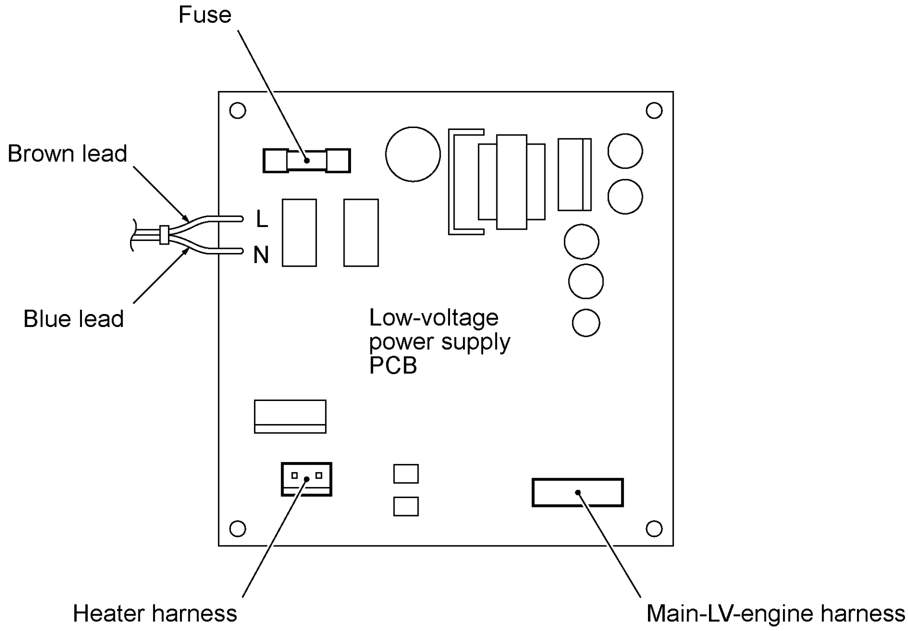
(6) To separate the power inlet from the low-voltage power supply PCB, unsolder the two lead wires from the PCB.



"g" and "i": Taptite, cup S M3x6
"h": Taptite, cup S M3x6 (Tightening torque: 0.5 N•m)

■ Reassembling Notes

- When connecting the power inlet to the low-voltage power supply PCB, insert the brown and blue lead wires into eyelets L and N in the PCB, respectively, and then solder those wires on the solder side of the PCB.



- After setting the power inlet back into place, fold the grounding wire into two and route the fold through cutout "Y" provided in the support film as shown on the previous page.
- When reinstalling the low-voltage power supply PCB, route the main-LV-engine harness through cutout "X" provided in the support film as shown on the previous page.

1.24 Inner Insulation Film, High-voltage Power Supply PCB, Engine PCB, and 2nd Cassette Relay PCB*

(*Provided on models available with a 2nd paper cassette)

(1) Remove screw "a" and take off the inner insulation film.

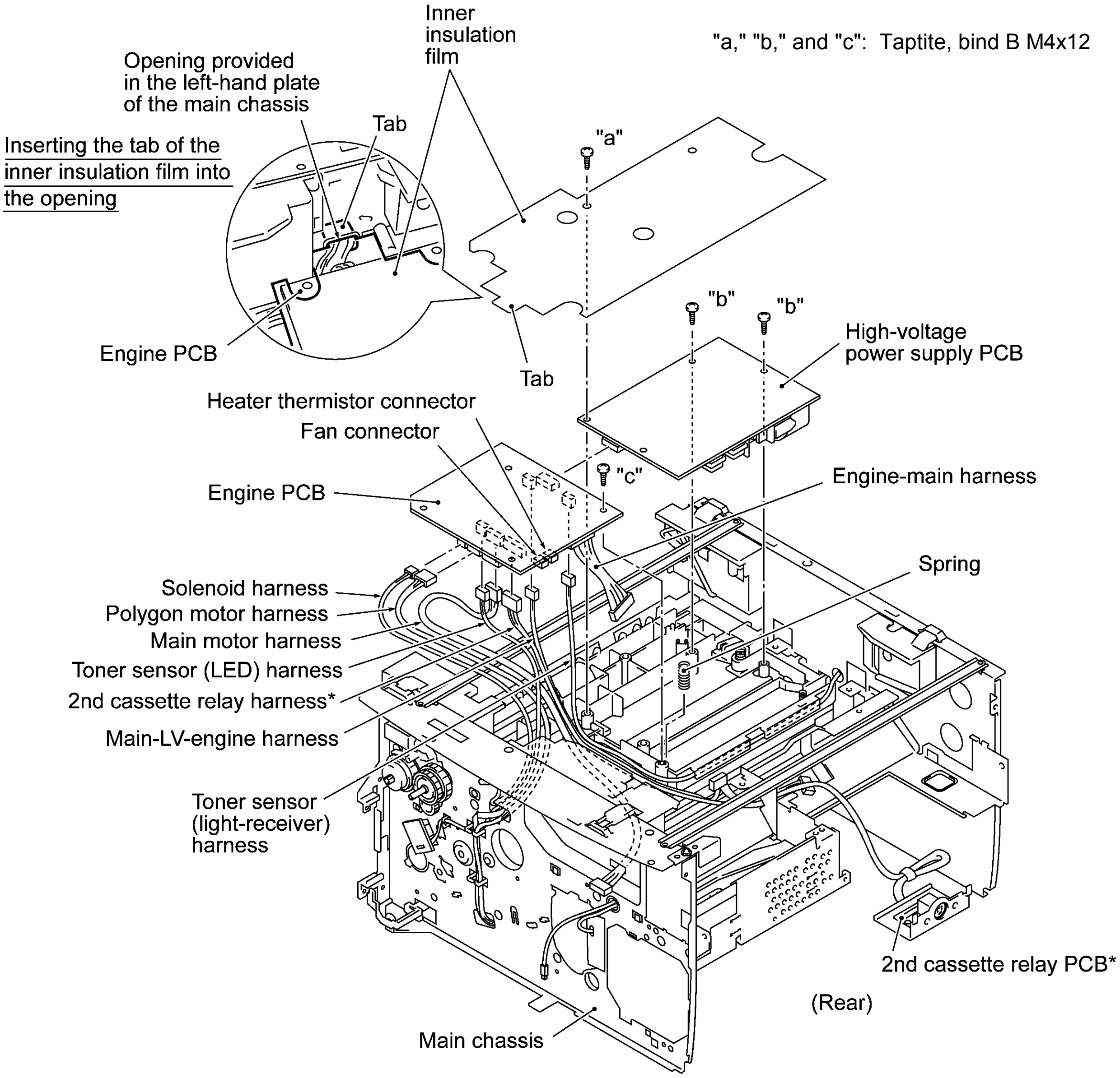
(2) Remove three screws (two "b" and one "c") from the high-voltage power supply PCB and engine PCB.

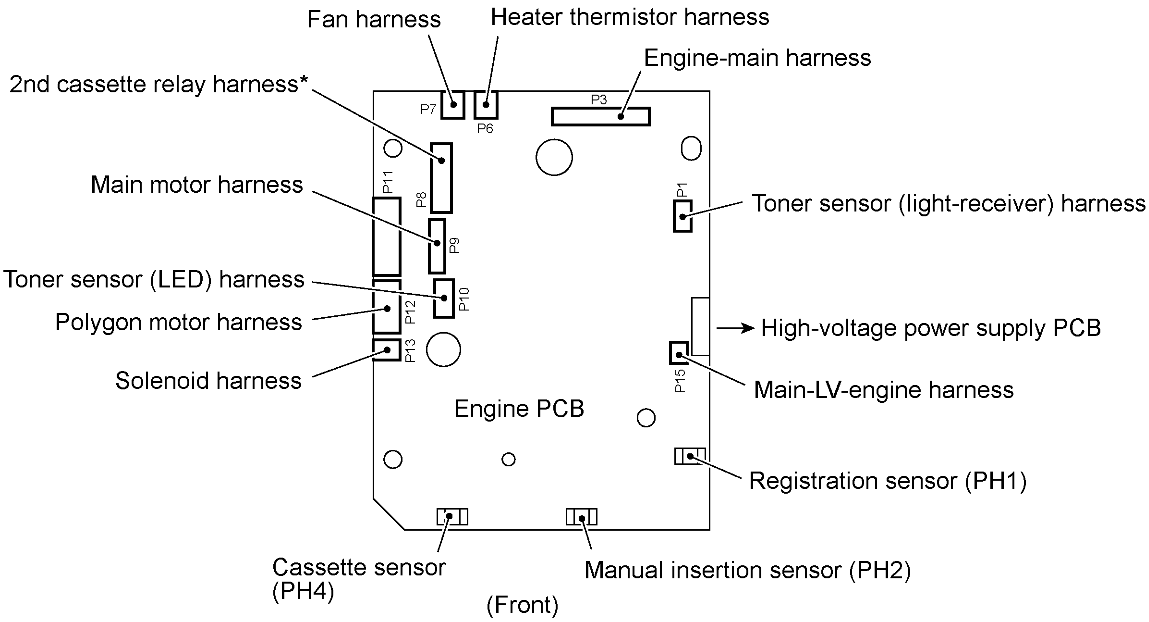
(3) Slightly lift up the high-voltage power supply PCB and disconnect it from the engine PCB.

(4) Pull the spring up and out.

(5) Slightly hold up the engine PCB and disconnect the following harnesses:

- Toner sensor (light-receiver) harness (3-pin, P1)
- Main-LV-engine harness (2-pin, P15)
- 2nd cassette relay harness* (8-pin, P8)
- Heater thermistor harness (2-pin, P6), if the heat-fixing unit has not been removed
- Fan harness (2-pin, P7), if the fan has not been removed
- Toner sensor (LED) harness (4-pin, P10)
- Main motor harness (6-pin, P9)
- Polygon motor harness (5-pin, P12)
- Solenoid harness (2-pin, P13)

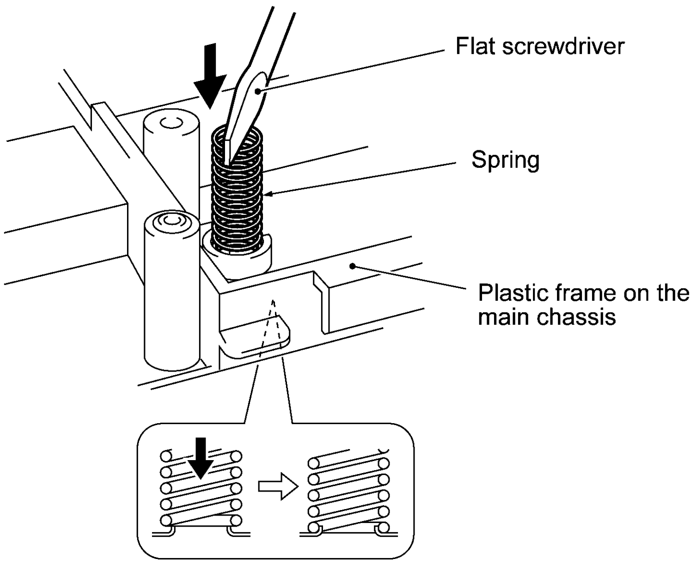




(6) For models available with a 2nd paper cassette: Pull the 2nd cassette relay PCB bracket to take out its harness. Remove the screw and take off the 2nd cassette relay PCB from its bracket.

■ Reassembling Notes

- Before reinstalling the high-voltage power supply PCB, push in the spring with a flat screwdriver until it snaps into place as shown below.

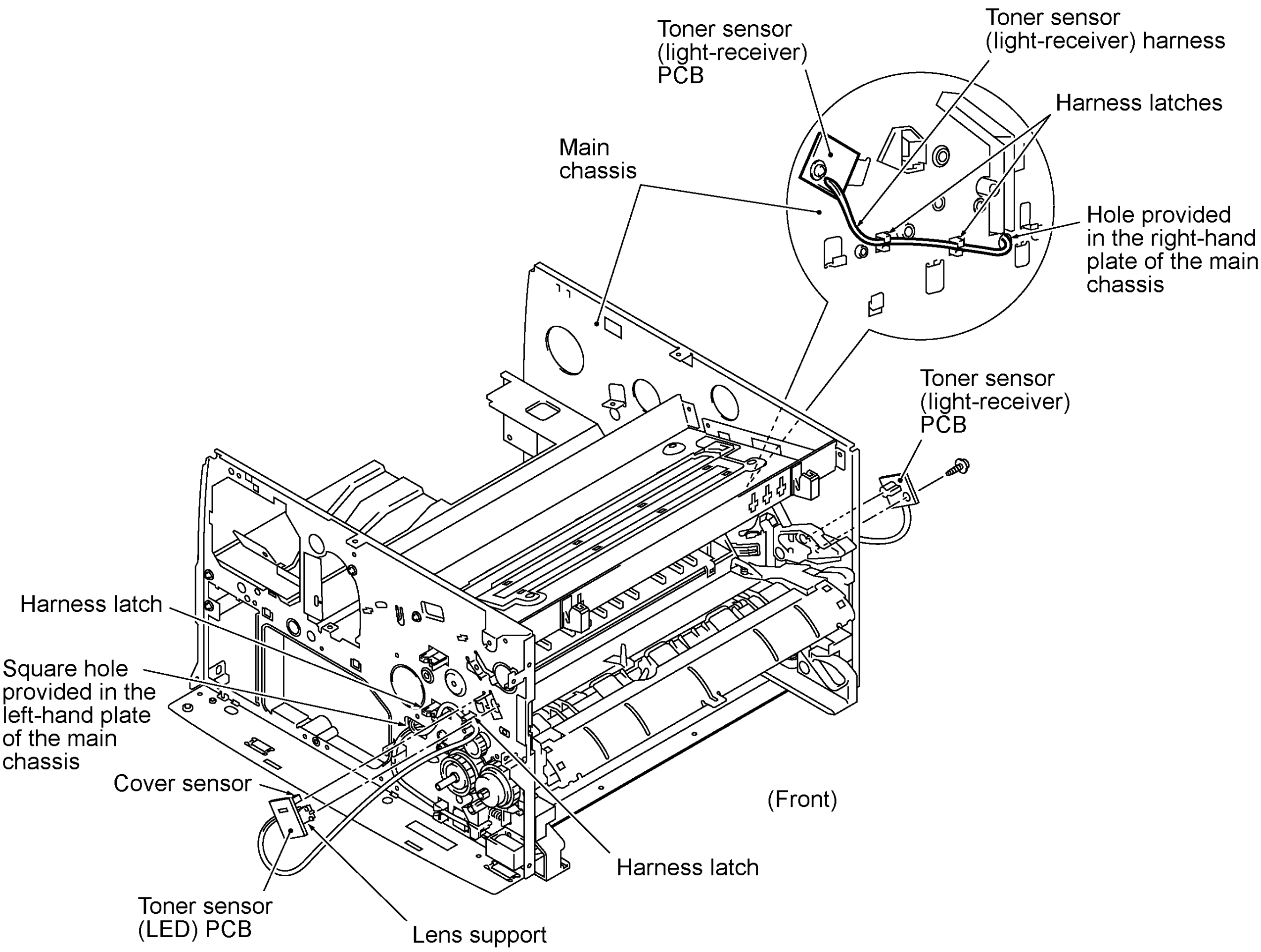


- Before reinstalling the high-voltage power supply PCB, check the high-voltage contacts for any toner particles, paper dust or dirt, and clean them out.

1.25 Toner Sensor (light-receiver) PCB and Toner Sensor (LED) PCB

(1) At the right-hand plate of the main chassis, remove the screw from the toner sensor (light-receiver) PCB, release its harness from the two harness latches, and then pull it out.

(2) At the left-hand plate of the main chassis, press the both sides of the lens support on the toner sensor (LED) PCB with your fingers to release them from the main chassis, release its harness from the two latches, and then pull it out.



■ Reassembling Notes

- Route the toner sensor (LED) harness on the left-hand side of the main chassis as shown above. Also refer to the illustration given on page IV-63.
- Route the toner sensor (light-receiver) harness on the right-hand side of the main chassis as shown above and on the top of the plastic frame as shown on page IV-63.

1.26 Gears and Paper Pick-up Roller

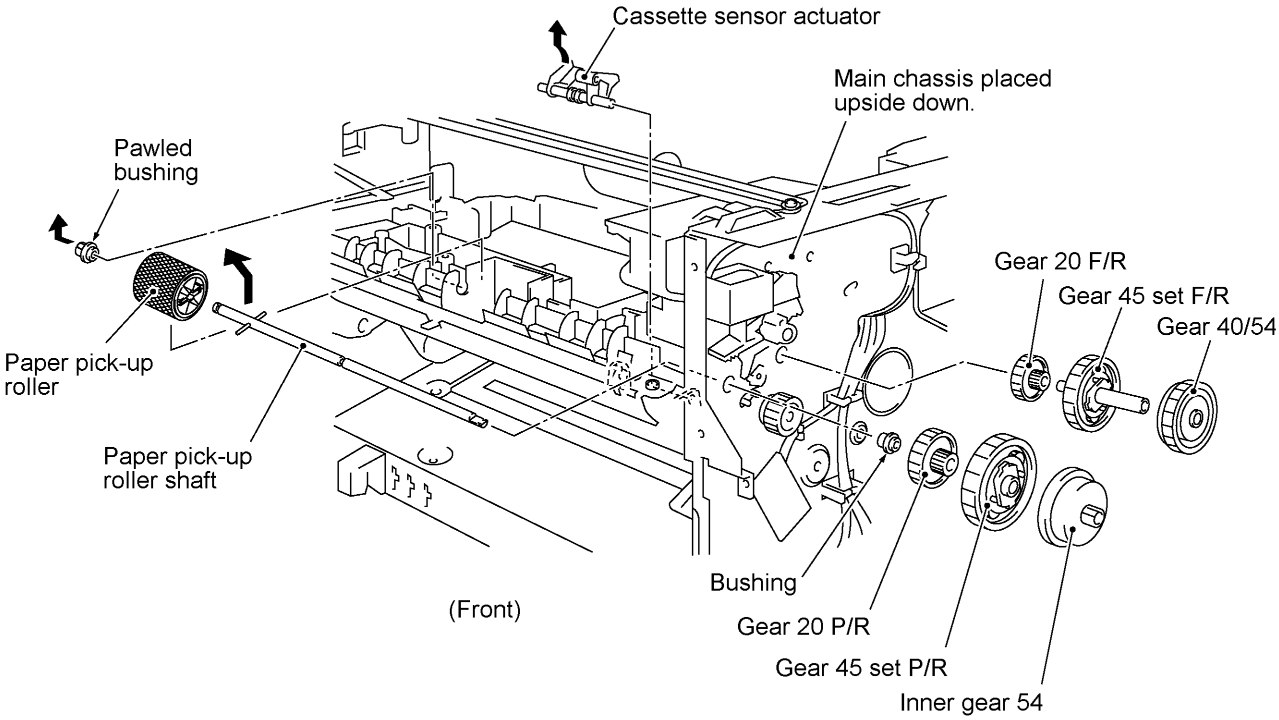
(1) Place the main chassis upside down.

(2) Remove the inner gear 54 (by pulling its pawl outwards), gear 45 set P/R, gear 20 P/R, and the bushing from the end of the paper pick-up roller shaft.

(3) Remove the pawled bushing by pulling its pawl outwards, then remove the paper pick-up roller and its shaft.

(4) Remove the gear 40/54, gear 45 set F/R, and gear 20 F/R.

(5) If the engine PCB has been removed, take out the cassette sensor actuator. (This prevents the actuator from dropping during the following disassembly jobs.)



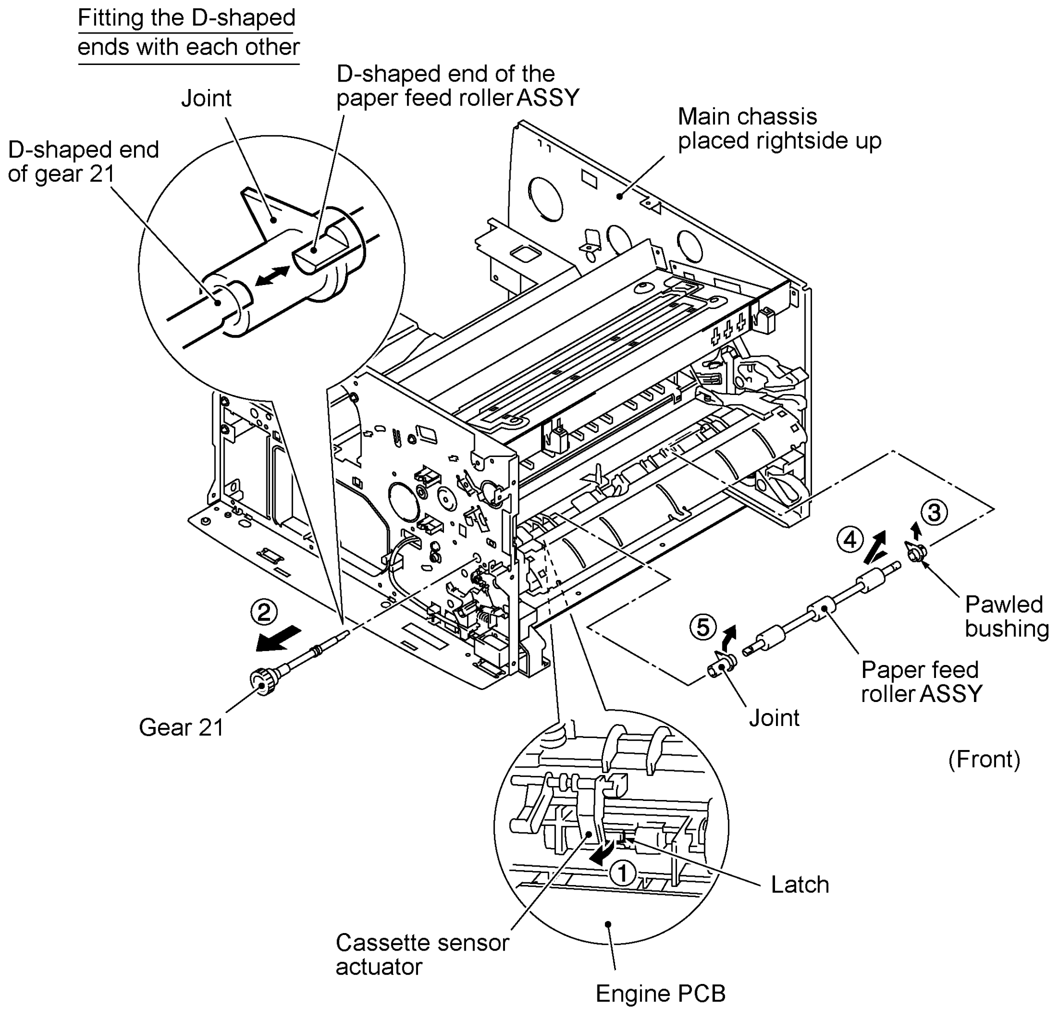
1.27 Paper Feed Roller ASSY

(1) Unhook the latch (arrow ①) provided on the underside of the plastic frame by using a small flat screwdriver and pull out the gear 21 (arrow ②).

(2) Place the main chassis rightside up.

(3) At the right end of the paper feed roller shaft, pull up the pawl of the bushing (arrow ③) with the tip of a flat screwdriver and move the paper feed roller ASSY to the left (arrow ④). Then take out the bushing and paper feed roller ASSY.

(4) Remove the joint (arrow ⑤).



■ Reassembling Notes

- When setting the gear 21 back into place, insert it and turn it so that its D-shaped end becomes fitted with the D-shaped end of the paper feed roller ASSY.

1.28 Clutch Levers, Cassette Guide L, and Solenoid

(1) Turn the main chassis upside down.

(2) Remove the two screws and take off the front underbar (which is shown on page IV-61).

(3) Place the main chassis rightside up.

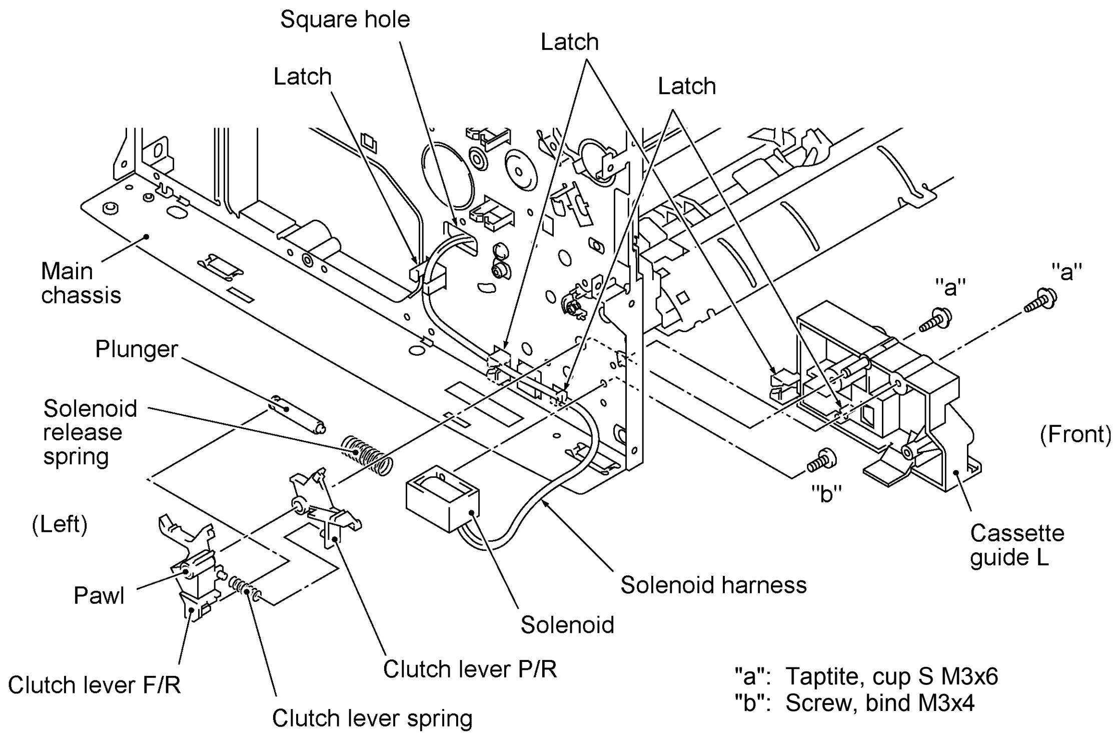
(4) Remove the clutch lever F/R by pulling its pawl outwards.

(5) Remove the clutch lever spring and clutch lever P/R.

(6) Remove the plunger and solenoid release spring.

(7) Remove two screws "a" and take off the cassette guide L.

(8) Remove screw "b" and take off the solenoid.

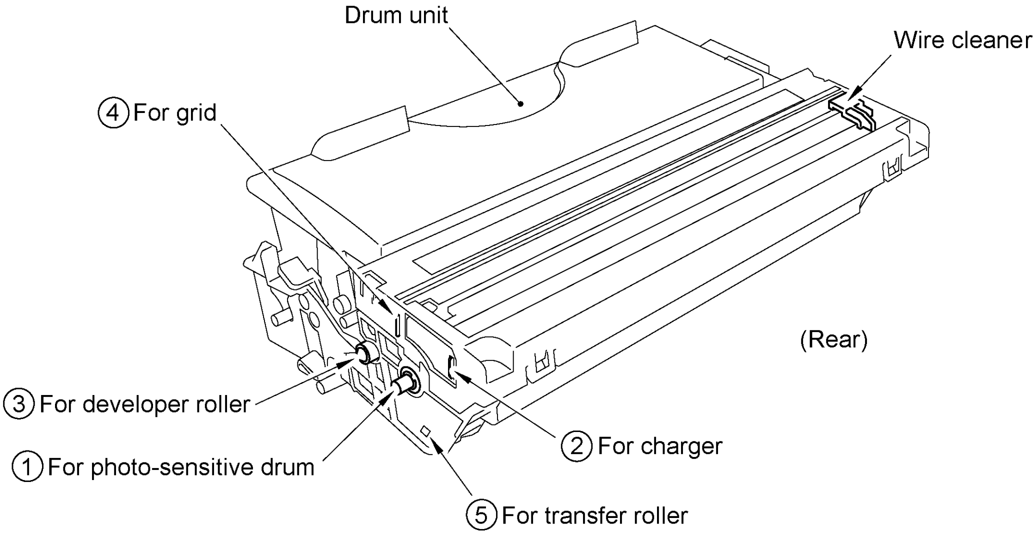


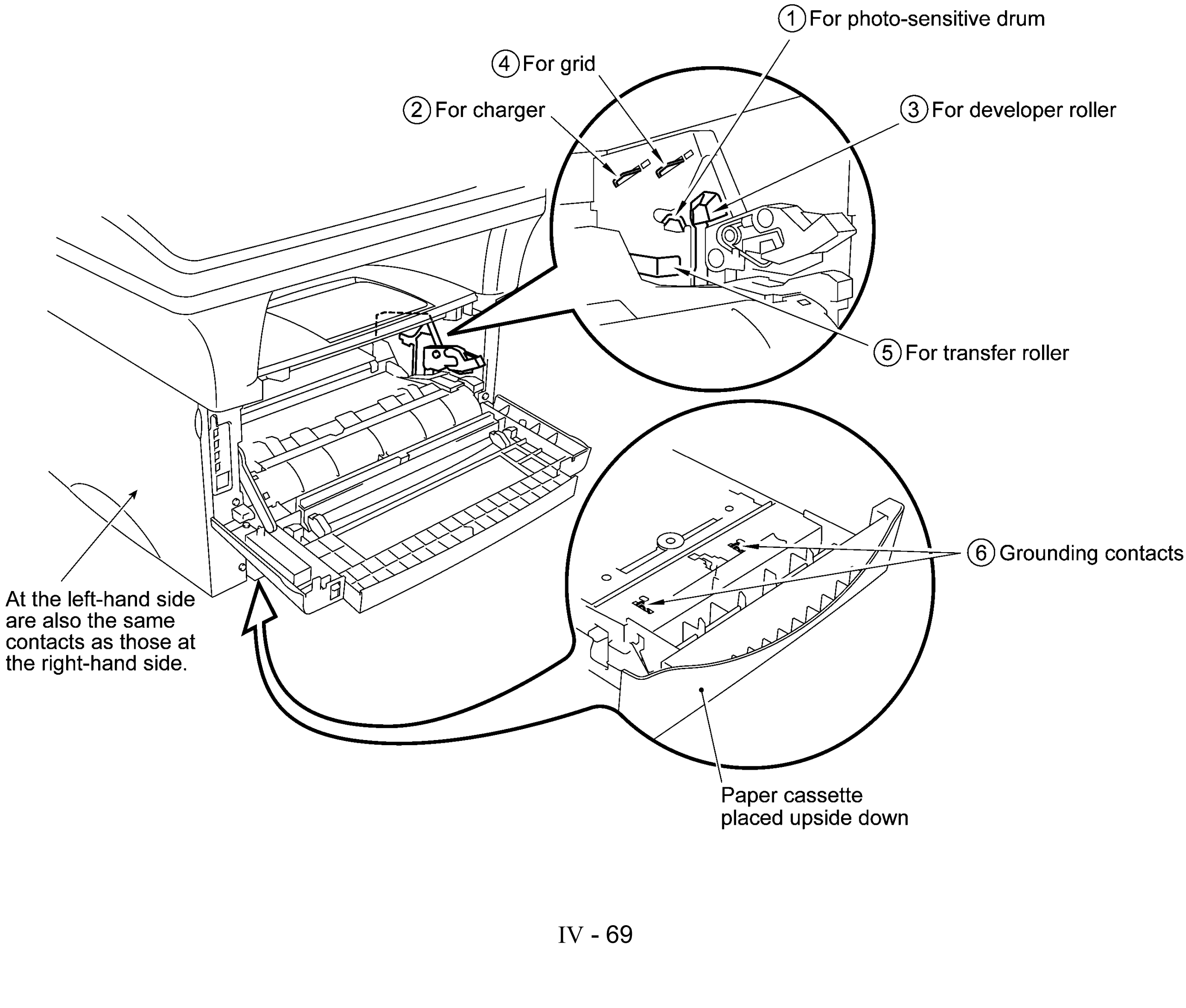
■ Reassembling Notes

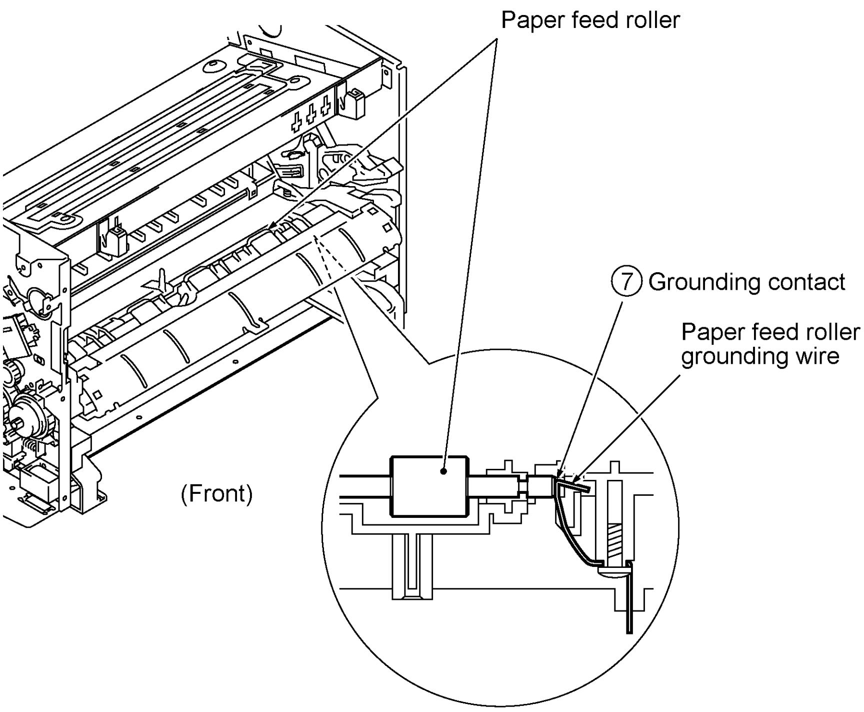
- Route the solenoid harness through three latches and pass it through the square hole provided in the left-hand plate of the main chassis.

1.29 Cleaning of High-voltage Contacts and Grounding Contacts

If any toner particles, paper dust or dirt are on the contacts, clean them out. This will ensure that power flows correctly to enable printing.







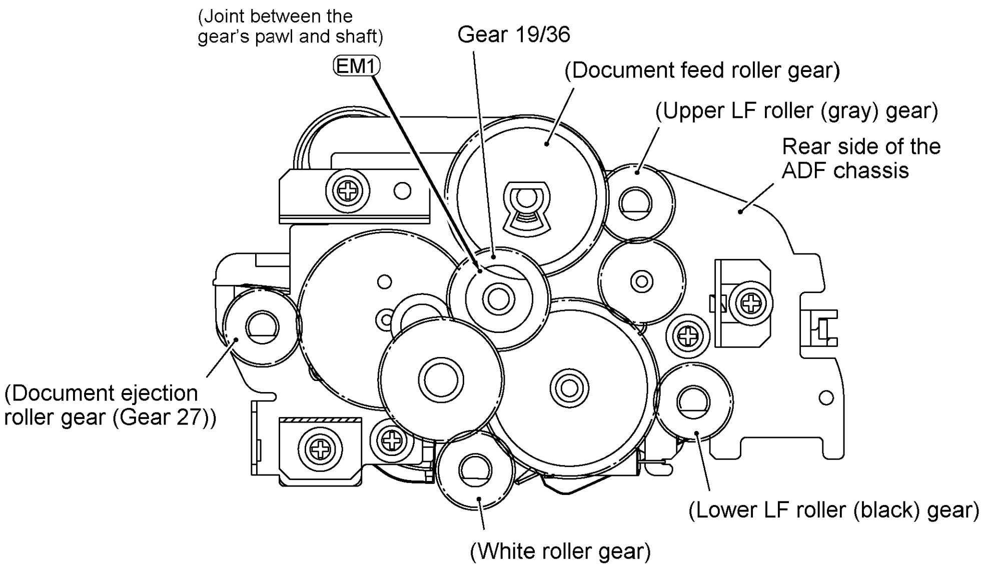
Viewed from the bottom

2. LUBRICATION

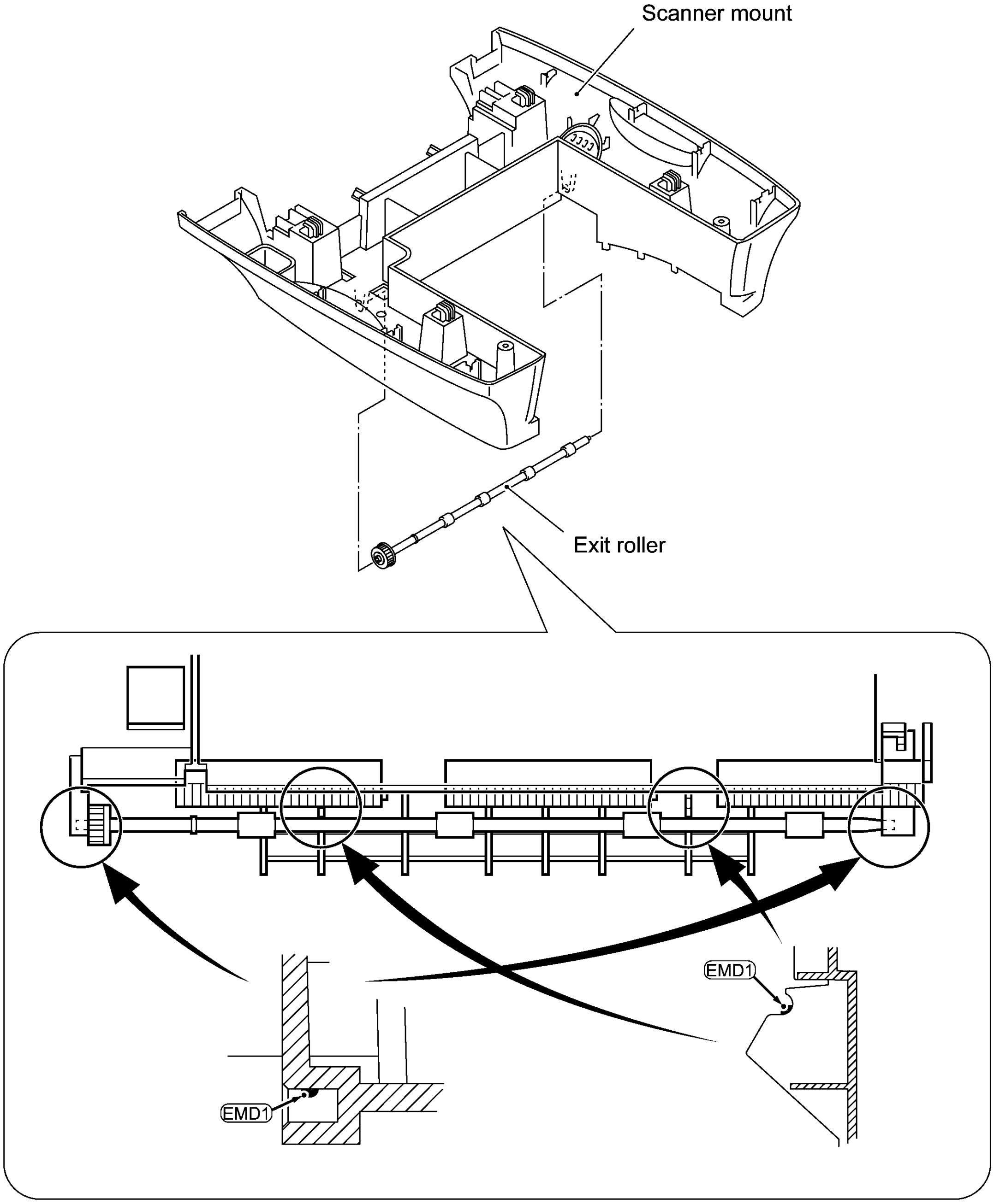
Apply the specified lubricants to the lubrication points as shown below.

Lubricant type (Manufacturer)	Lubricant amount			
	Half of a rice-sized pinch of grease ($3\ mm^3$)	Rice-sized pinch of grease ($6\ mm^3$)	Two rice-sized pinches of grease ($12\ mm^3$)	Five rice-sized pinches of grease ($30\ mm^3$)
Molykote grease EM-30L (Dow Corning)	————	EM1	————	————
Molykote grease EMD-110 (Dow Corning.)	————	EMD1	————	————
Molykote grease PG662 (Dow Corning)	————	PG1	————	————

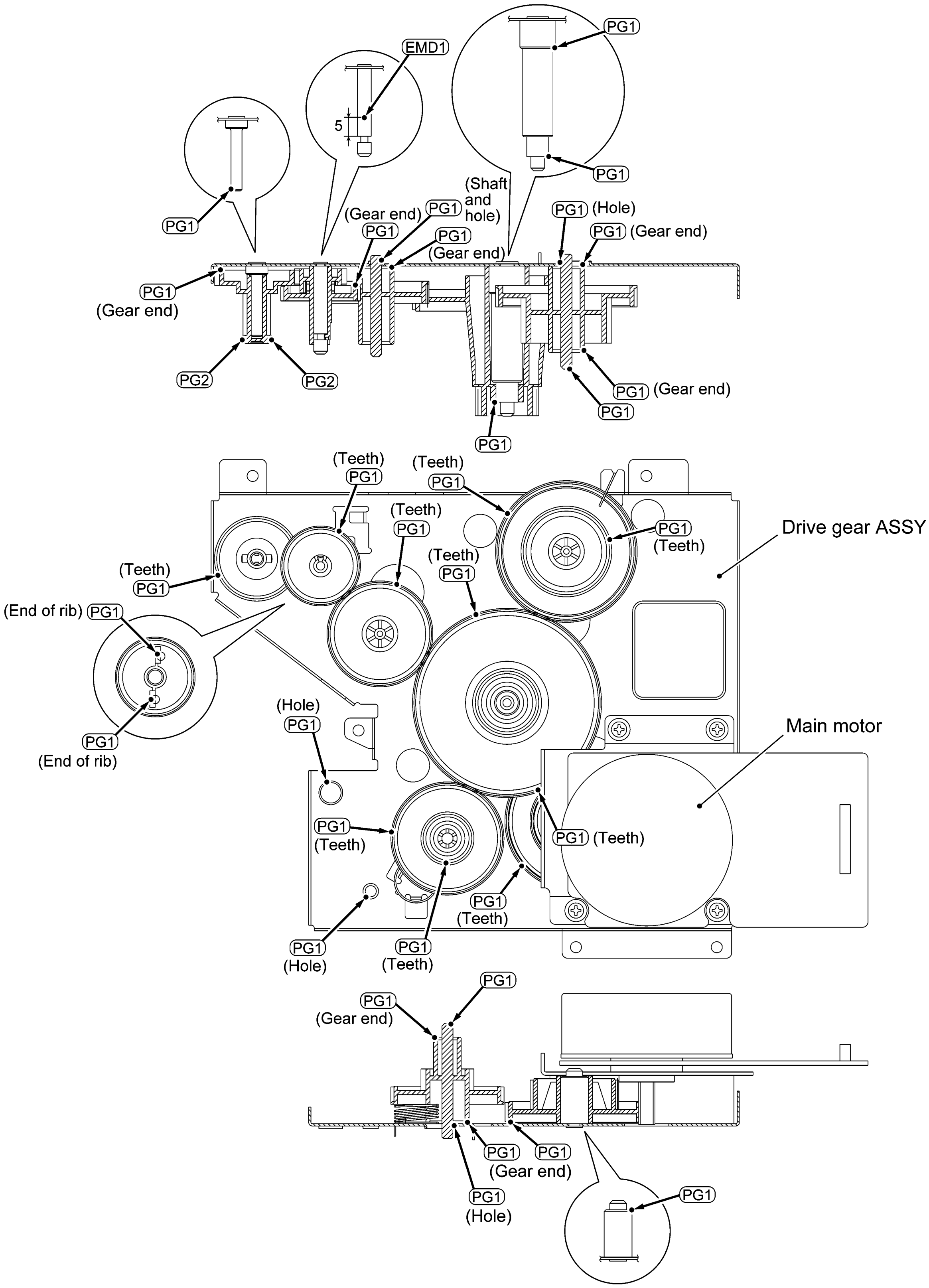
[1] ADF unit



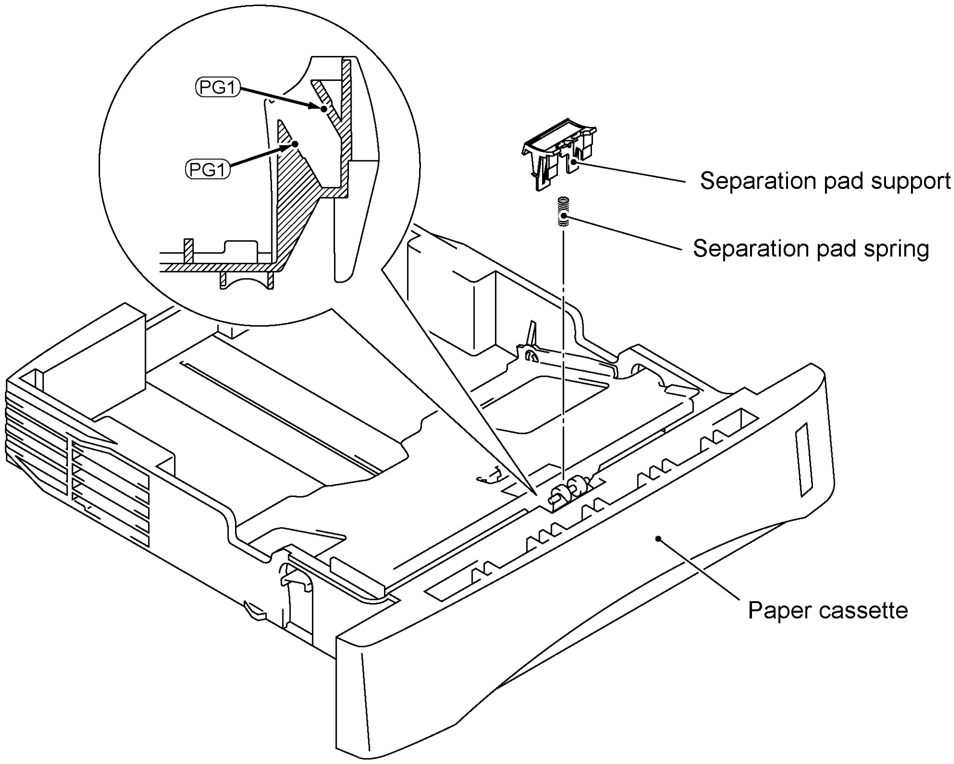
[2]   Scanner mount



[3] Drive gear ASSY



[4] Paper cassette



CHAPTER V.

MAINTENANCE MODE

CHAPTER V. MAINTENANCE MODE

CONTENTS

1. ENTRY INTO THE MAINTENANCE MODE V-1

2. LIST OF MAINTENANCE-MODE FUNCTIONS V-2

3. DETAILED DESCRIPTION OF MAINTENANCE-MODE FUNCTIONS V-5

3.1 EEPROM Parameter Initialization V-5
3.2 Printout of Scanning Compensation Data V-6
3.3 ADF Performance Test V-8
3.4 Test Pattern 1 .... V-9
3.5 Firmware Switch Setting and Printout V-10
3.6 Operational Check of LCD V-13
3.7 Operational Check of Control Panel PCB V-13
3.8 Sensor Operational Check V-15
3.9 CCD Scanner Area Setting V-16
3.10 EEPROM Customizing V-16
3.11 Erasure of Received FAX Messages Temporarily Stored in the Flash Memory (Not applicable to the American version)............................... V-17
3.11A Display of the Equipment's Log Information V-17-1
3.12 Machine Error Code Indication V-18
3.13 Output of Transmission Log to the Telephone Line (Not applicable to machines w/o fax) V-18
3.14 Cancellation of the Memory Security Mode (Not applicable to the American version or machines w/o fax) V-19

1. ENTRY INTO THE MAINTENANCE MODE

For machines w/ fax

To make the machine enter the maintenance mode, press the **Menu**, *, **2**, **8**, **6**, and **4** keys in this order.

|← Within 2 seconds →|

For machines w/o fax

To make the machine enter the maintenance mode, press the **Menu**, **0**, **2**, **8**, **6**, and **4** keys in this order.

|← Within 2 seconds →|

The machine beeps for approx. one second and displays " ▮▮ MAINTENANCE ▮▮▮ " on the LCD, indicating that it is placed in the initial stage of the maintenance mode, a mode in which the machine is ready to accept entry from the keys.

To select one of the maintenance-mode functions listed in Section 2, enter the corresponding 2-digit function code with the numerical keys on the control panel. (The details of each maintenance-mode function are described in Section 3.)

NOTES:

- Pressing the **9** key twice in the initial stage of the maintenance mode makes the machine exit from the maintenance mode, restoring it to the standby state.

  If you want to initialize the EEPROM (Function code: 01), however, you need to turn the power off after the initialization procedure without pressing the **9** key twice. Pressing the **9** key twice will not fully initialize the EEPROM.

- Pressing the **Stop** key after entering only one digit restores the machine to the initial stage of the maintenance mode.

- If an invalid function code is entered, the machine resumes the initial stage of the maintenance mode.

2. LIST OF MAINTENANCE-MODE FUNCTIONS

Maintenance-mode Functions

Function Code	Function	Reference Subsection (Page)
01	EEPROM Parameter Initialization	3.1 (V-5)
02	————	————
03	————	————
04	————	————
05	Printout of Scanning Compensation Data	3.2 (V-6)
06	————	————
07	————	————
08	ADF* Performance Test	3.3 (V-8)
09	Test Pattern 1	3.4 (V-9)
10	Firmware Switch Setting	3.5 (V-10)
11	Printout of Firmware Switch Data	3.5 (V-12)
12	Operational Check of LCD	3.6 (V-13)
13	Operational Check of Control Panel PCB (Check of Keys and Buttons)	3.7 (V-13)
14	————	————
15	————	————
16	————	————
32	Sensor Operational Check	3.8 (V-15)
55	CCD Scanner Area Setting	3.9 (V-16)
74	EEPROM Customizing	3.10 (V-16)
79	Erasure of Received FAX Messages Temporarily Stored in the Flash Memory (Not applicable to the American version)	3.11 (V-17)
80	Display of the Equipment's Log Information	3.11A (V-17-1)
82	Machine Error Code Indication	3.12 (V-18)
87	Output of Transmission Log to the Telephone Line (Not applicable to machines w/o fax)	3.13 (V-18)
91	EEPROM Parameter Initialization (except the telephone number storage area)	3.1 (V-5)
99	Exit from the Maintenance Mode	---- (V-1)

* ADF: Automatic document feeder

------------------------- **IMPORTANT** -------------------------------

Basically, the maintenance-mode functions listed on the previous page should be accessed by service personnel only. However, you may allow end users to access some of these under the guidance of service personnel (e.g., by telephone).

The user-accessible functions (codes 10, 11, 12, 80, 82, 87 and 91) are <u>shaded</u> in the table given on the previous page. Function code 10 accesses the firmware switches (WSW), each of which has eight selectors. You should not allow end users to access all of those selectors, but you may allow them to access user-accessible selectors which are <u>shaded</u> in the firmware switch tables in Subsection 3.5.

The service personnel should instruct end users to follow the procedure given below.

(1) <u>For machines w/ fax</u>:

Press the **Menu** and **Resolution** keys in this order.

<u>For machines w/o fax:</u>

Press the **Menu** and **Sort** keys in this order.

The LCD clears the current display.

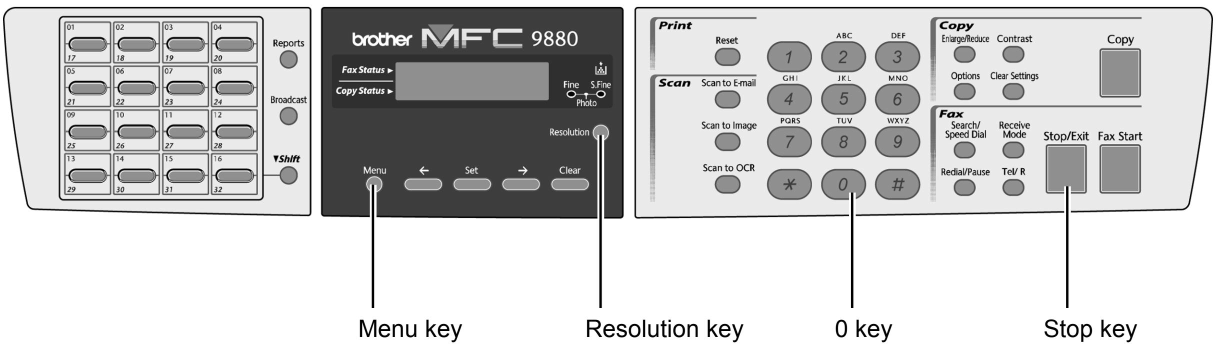
(2) Press the **0** key.

(3) Enter the desired function code (10, 11, 12, 80, 82, 87, or 91) with the numerical keys.

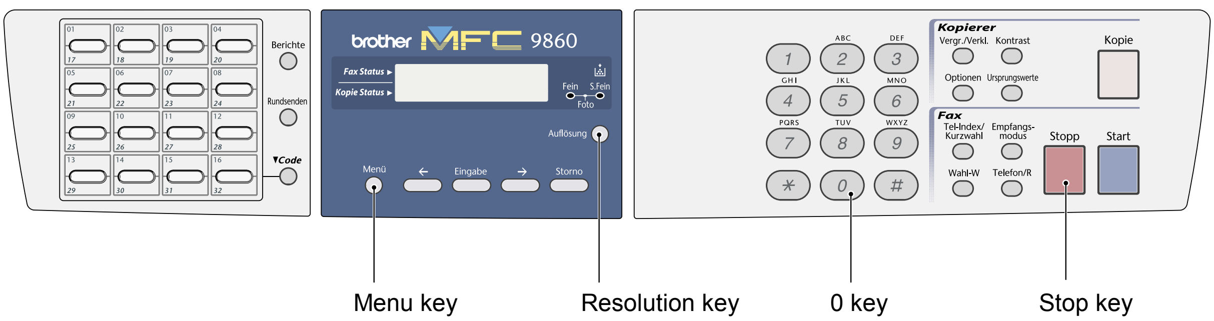
For function code 10, access the desired firmware switch according to the operating procedure described in Subsection 3.5.

(4) To make the machine return to the standby state, press the **Stop** key.

<u>MFC9800/MFC9880</u>



<u>MFC9860</u>



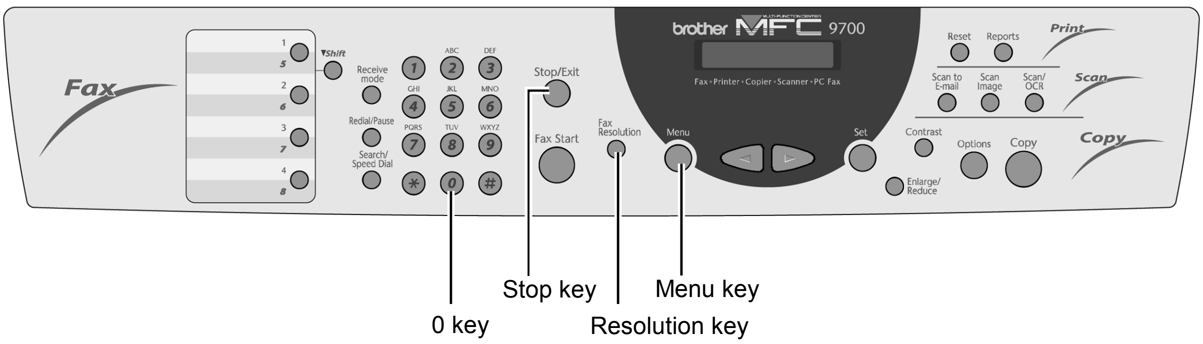
DCP1400



MFC9760



MFC9700



3. DETAILED DESCRIPTION OF MAINTENANCE-MODE FUNCTIONS

3.1 EEPROM Parameter Initialization

■ **Function**

The machine initializes the parameters, user switches, and firmware switches registered in the EEPROM, to the initial values. Entering the function code 01 initializes all of the EEPROM areas, but entering 91 does not initialize some areas, as listed below.

Data item \ Function code	01	91
Maintenance-mode functions User switches Firmware switches Remote activation code	All of these will be initialized	These will be initialized
Activity report Station ID data Outside line number Telephone function registration One-touch dialing Speed dialing Group dialing Received FAX messages	All of these will be initialized	These will not be initialized
EEPROM customizing code (4-digit)	These will not be initialized. (Note that the first digit of the 4-digit customizing code will be initialized to "0." If the code is 1001, for example, it will be initialized to 0001.)	

NOTE: If you replace the main PCB with one used for any other machine, carry out this procedure and then customize the EEPROM (maintenance-mode function code 74 in Subsection 3.10).

■ **Operating Procedure**

(1) Press the **0** and **1** keys (or the **9** and **1** keys according to your need) in this order in the initial stage of the maintenance mode.

The "PARAMETER INIT" will appear on the LCD.

(2) Upon completion of parameter initialization, the machine returns to the initial stage of the maintenance mode.

(3) Be sure to turn the machine power off. If you press the **9** key twice to exit from the maintenance mode without turning the power off, then the machine will not fully initialize the EEPROM.

3.2 Printout of Scanning Compensation Data

■ **Function**

The equipment prints out the white and black level data for scanning compensation.

■ **Operating Procedure**

Do not start this function merely after powering on the equipment but start it after carrying out a sequence of scanning operation. Unless the equipment has carried out any scanning operation, this function cannot print out correct scanning compensation data. This is because at the start of scanning operation, the equipment initializes white and black level data and takes in the scanning compensation reference data.

(1) Press the **0** and **5** keys in this order in the initial stage of the maintenance mode.

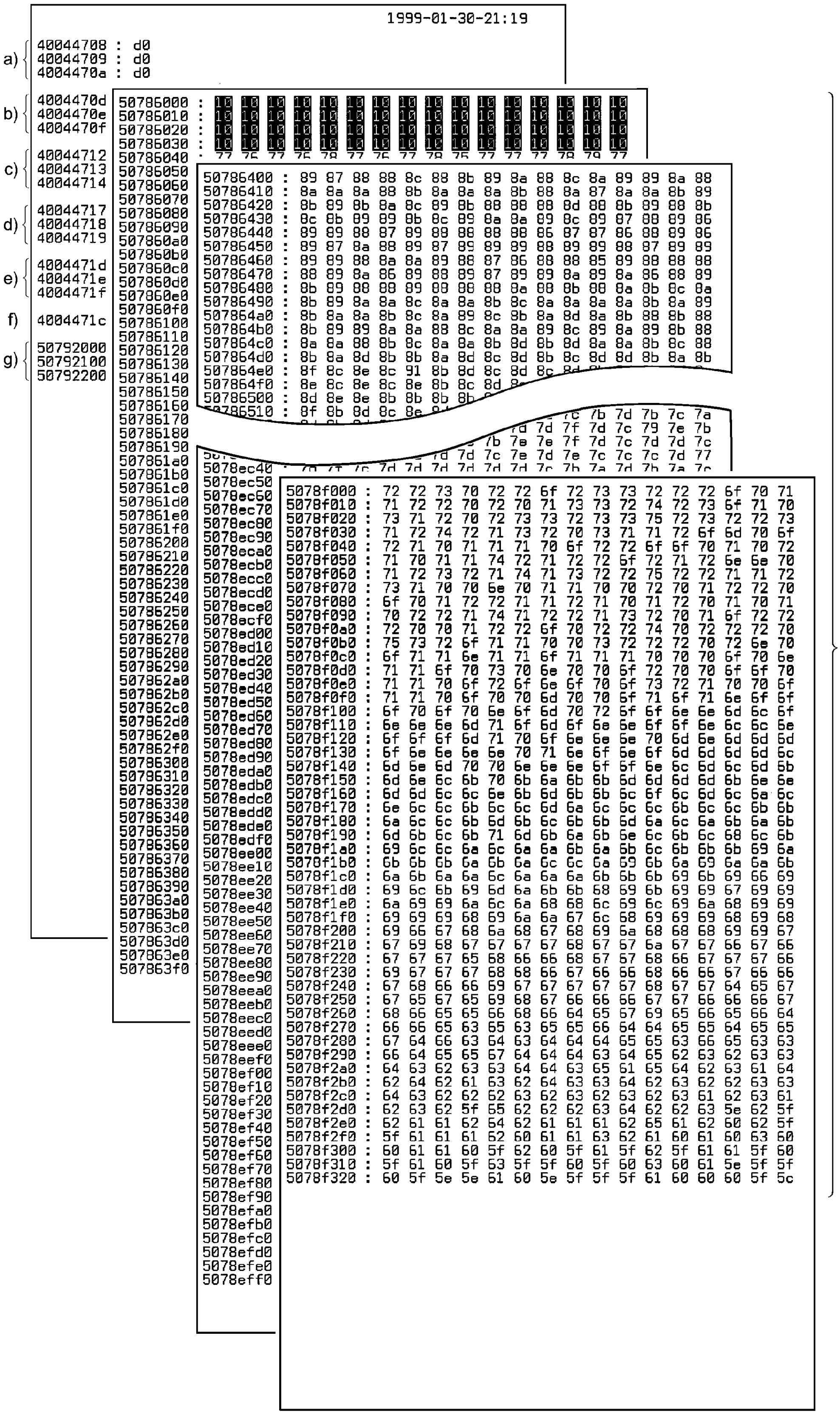
The "WHITE LEVEL 1" will appear on the LCD.

(2) The equipment prints out the scanning compensation data list containing the following:

a) A/D converter reference level for high value (3 bytes for green, blue, and red)
b) A/D converter reference level for low value (3 bytes for green, blue, and red)
c) Dark level offset data (3 bytes for green, blue, and red)
d) Gain control data (3 bytes for green, blue, and red)
e) Voltage division data (3 bytes for green, blue, and red)
f) Compensation data for background color (1 byte)
g) 2-value quantization black level data (3 bytes for green, blue, and red)
h) 2-value quantization white level data (4912 bytes for green)
i) 2-value quantization white level data (4912 bytes for blue)
j) 2-value quantization white level data (4912 bytes for red)

(3) Upon completion of recording of the compensation data list, the equipment returns to the initial stage of the maintenance mode.

NOTE: If any data is abnormal, its code will be printed in inline style, as shown on the next page.



Scanning Compensation Data List

3.3 ADF Performance Test

■ **Function**

The machine counts the documents fed by the automatic document feeder (ADF) and displays the count on the LCD for checking the ADF performance.

■ **Operating Procedure**

(1) Set documents. (Allowable up to the ADF capacity.)

The "DOC. READY" will appear on the LCD.

(2) Press the **0** and **8** keys in this order.

While counting the documents, the machine feeds them in and out, displaying the current count on the LCD as shown below.

```
ADF CHECK P.01
```

↑ Current count (1st page in this example)

(3) After showing the final count, the machine beeps for one second. To return the machine to the initial stage of the maintenance mode, press the **Stop** key.

3.4 Test Pattern 1

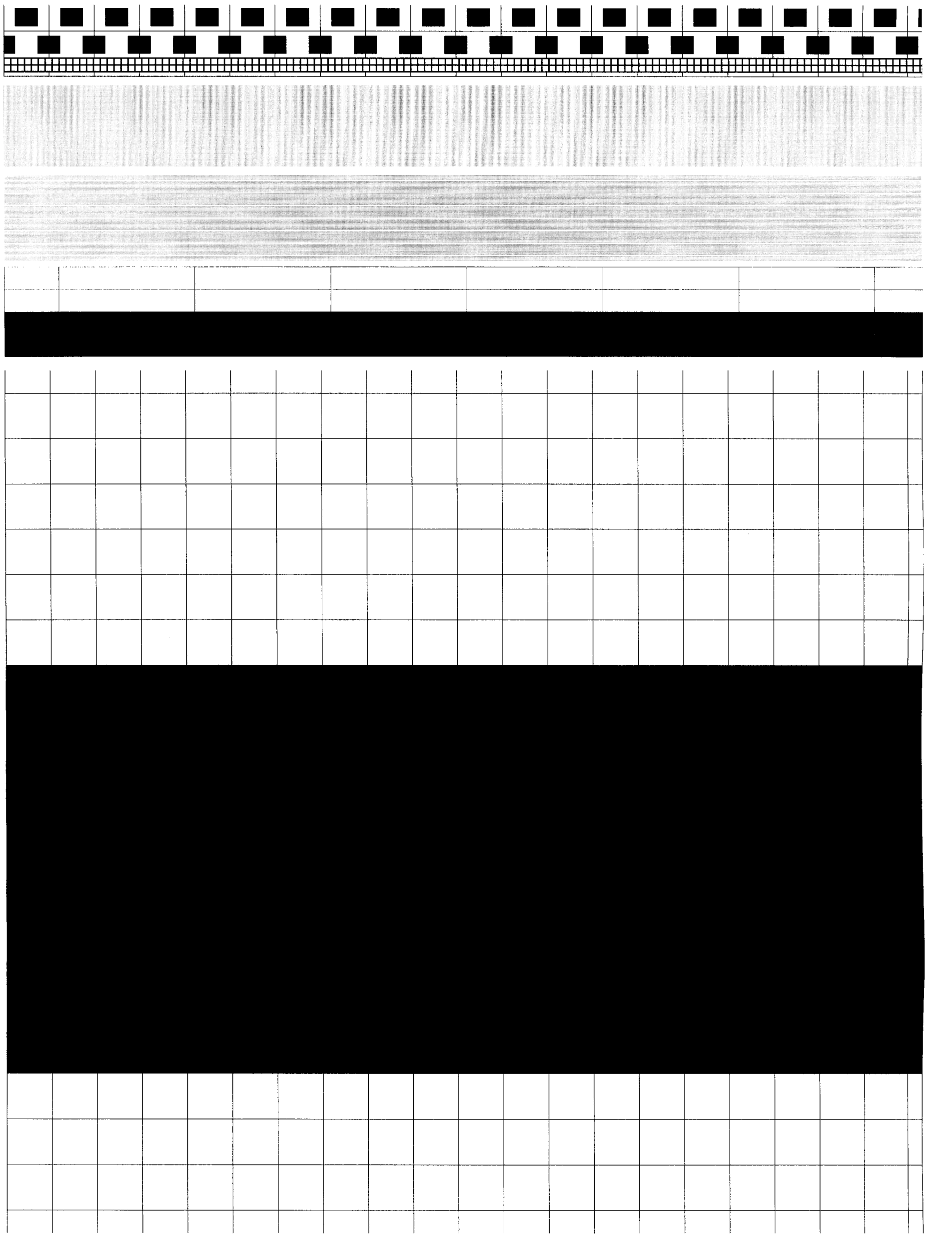
■ Function

This function, much like the copying function, prints out test pattern 1 to allow the service personnel to check for record data missing or print quality.

■ Operating Procedure

Press the **0** and **9** keys in this order in the initial stage of the maintenance mode.

The figure below shows test pattern 1.



Test Pattern 1

3.5 Firmware Switch Setting and Printout

[A] Firmware switch setting

■ Function

The machine incorporates the following firmware switch functions which may be activated with the procedures using the control panel keys and buttons.
The firmware switches have been set at the factory in conformity to the communications standards and codes of each country. Do not disturb them unless necessary. Some firmware switches may not be applicable in some versions. The firmware switch data list indicates "Not used." for those inapplicable switches.

NOTE: Machines w/o fax support some selectors of firmware switches. Those selector numbers are circled.

Firmware Switches (WSW01 through WSW50)

WSW No.	Function
WSW01	Dial pulse setting
WSW02	Tone signal setting
WSW03	PABX mode setting
WSW04	TRANSFER facility setting
WSW05	1st dial tone and busy tone detection
WSW06	**Pause** key setting and 2nd dial tone detection
WSW07	Dial tone setting 1
WSW08	Dial tone setting 2
WSW09	Protocol definition 1
WSW10	Protocol definition 2
WSW11	Busy tone setting
WSW12	Signal detection condition setting
WSW13	Modem setting
WSW14	AUTO ANS facility setting
WSW15	REDIAL facility setting
WSW16	Function setting 1
WSW17	Function setting 2
WSW18	Function setting 3
WSW19	Transmission speed setting
WSW20	Overseas communications mode setting
WSW21	TAD setting 1
WSW22	ECM setting
WSW23	Communications setting
WSW24	TAD setting 2
WSW25	TAD setting 3
WSW26	Function setting 4
WSW27	Function setting 5
WSW28	Function setting 6
WSW29	Function setting 7
WSW30	Function setting 8
WSW31	Function setting 9
WSW32	Function setting 10
WSW33	Function setting 11
WSW34	Function setting 12
WSW35	Function setting 13
WSW36	Function setting 14
WSW37	Function setting 15

Firmware Switches (WSW01 through WSW50) *Continued*

WSW No.	Function
WSW38	Function setting 16
WSW39	Function setting 17
WSW40	Function setting 18
WSW41	Function setting 19
WSW42	Function setting 20
WSW43	Function setting 21
WSW44	Speeding up scanning-1
WSW45	Speeding up scanning-2
WSW46	Monitor of power ON/OFF state and parallel port kept at high
WSW47	Delay of FAX line disconnection
WSW48	Not used.
WSW49	Not used.
WSW50	Not used.

■ Operating Procedure

(1) Press the **1** and **0** keys in this order in the initial stage of the maintenance mode.

The machine displays the "WSW00" on the LCD and becomes ready to accept a firmware switch number.

(2) Enter the desired number from the firmware switch numbers (01 through 50).

The following appears on the LCD:

```
           Selector 1      Selector 8
               ↓               ↓
WSWXX =        0 0 0 0 0 0 0 0
```

(3) For machines w/ fax: Use the ◀ and ▶ keys to move the cursor to the selector position to be modified.

For machines w/o fax: Use the **Reset** key to move the cursor to the selector position to be modified.

(4) Enter the desired number using the **0** and **1** keys.

(5) For machines w/ fax: Press the **Set** key.
For machines w/o fax: Press the **Menu** key.

This operation saves the newly entered selector values onto the EEPROM and readies the machine for accepting a firmware switch number.

(6) Repeat steps (2) through (5) until the modification for the desired firmware switches is completed.

(7) Press the **Stop** key to return the machine to the initial stage of the maintenance mode.

NOTES:
- To cancel this operation and return the machine to the initial stage of the maintenance mode during the above procedure, press the **Stop** key.
- If there is a pause of more than one minute after a single-digit number is entered for double-digit firmware switch numbers, the machine will automatically return to the initial stage of the maintenance mode.

■ Details of Firmware Switches

The details of the firmware switches are described in Appendix 2 in which the user-accessible selectors of the firmware switches are shaded.

[B] Printout of firmware switch data

■ Function

The machine prints out the setting items and contents specified by the firmware switches.

■ Operating Procedure

(1) Press the **1** key twice in the initial stage of the maintenance mode.
The "PRINTING" will appear on the LCD.

(2) The machine prints out the configuration list as shown in the figure below.

(3) Upon completion of printing, the machine returns to the initial stage of the maintenance mode.

```
CONFIGURATION LIST

MODEL  : 8C5-505
TIME   : 08/16/2001 20:01
REV.   : U0107260928VER.A
PCI    : 5.00
SUM    : E5B5
SER.#  : BROF97011006

WSW01 = 00000010
WSW02 = 11111010
WSW03 = 10000000
WSW04 = 00010111
WSW05 = 00000110
WSW06 = 00101100
WSW07 = 01001100
WSW08 = 01100100
WSW09 = 00000000
WSW10 = 00010100
WSW11 = 01011000
WSW12 = 10011011
WSW13 = 00011010
WSW14 = 01100111
WSW15 = 00001110
WSW16 = 01100010
WSW17 = 00100011
WSW18 = 10001010
WSW19 = 11100000
WSW20 = 10011111
WSW21 = 00101000
WSW22 = 00100000
WSW23 = 00001110
WSW24 = 01000010
WSW25 = 00011010
WSW26 = 00110010
WSW27 = 00100001
WSW28 = 00000000
WSW29 = 01101001
WSW30 = 10000000
WSW31 = 10100101
WSW32 = 01010000
WSW33 = 10000010
WSW34 = 00010000
WSW35 = 01000000
WSW36 = 00001000
WSW37 = 10000101
WSW38 = 00010100
WSW39 = 11110000
WSW40 = 00000000
WSW41 = 00000111
WSW42 = 11110100
WSW43 = 00000001
WSW44 = 00000010
WSW45 = 00000010
WSW46 = 00000000
WSW47 = 00000000
WSW48 = 00000000
WSW49 = 00000000
WSW50 = 00000000
```

3.6 Operational Check of LCD

■ **Function**

This function allows you to check whether the LCD on the control panel works normally.

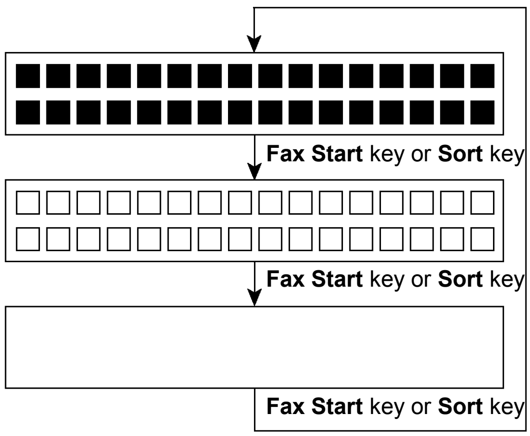
■ **Operating Procedure**

(1) Press the **1** and **2** keys in this order in the initial stage of the maintenance mode.

The LCD shows

(2) For machines w/ fax: Press the **Fax Start** key. Each time you press the **Fax Start** key, the LCD cycles through the displays shown at right.

For machines w/o fax: Press the **Sort** key. Each time you press the **Sort** key, the LCD cycles through the displays shown at right.



(3) Press the **Stop** key in any process of the above display cycle. The machine beeps for one second and returns to the initial stage of the maintenance mode.

NOTE: The above illustration shows a 2-row LCD as a sample.

3.7 Operational Check of Control Panel PCB

■ **Function**

This function allows you to check the control panel PCB for normal operation.

■ **Operating Procedure**

(1) Press the **1** and **3** keys in this order in the initial stage of the maintenance mode.

The "00 " will appear on the LCD.

(2) Press the keys and buttons in the order designated in the illustration shown below.

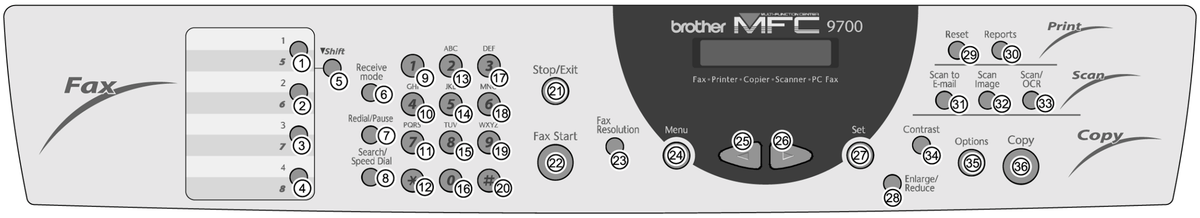
The LCD shows the corresponding number in decimal notation each time a key or button is pressed. Check that the displayed number is correct by referring to the illustration below.

If a key or button is pressed out of order, the machine beeps and displays the "INVALID OPERATE" on the LCD. To return to the status ready to accept key & button entry for operational check, press the **Stop** key.

(3) After the last number key or button is pressed, the machine beeps and returns to the initial stage of the maintenance mode.

To terminate this operation, press the **Stop** key. The machine returns to the initial stage of the maintenance mode.

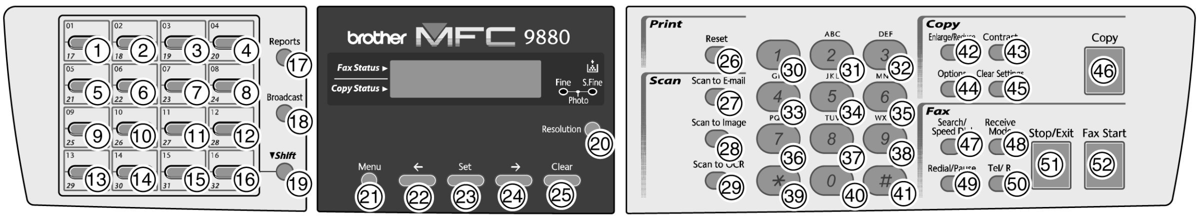
MFC9700



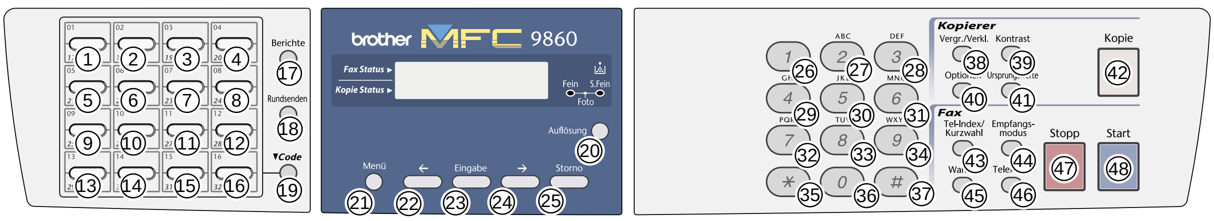
DCP1400



MFC9800/9880

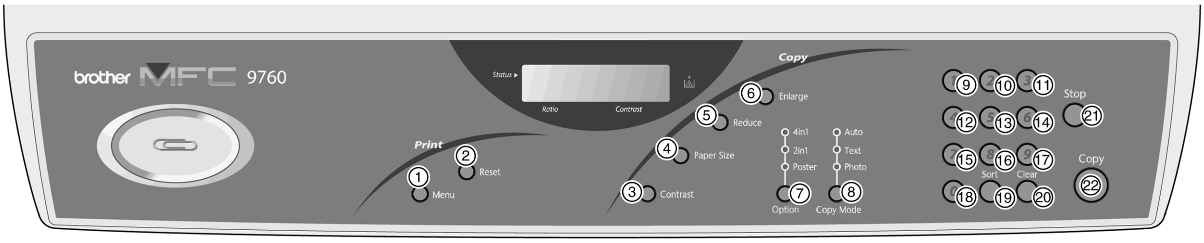


MFC9860



Key & Button Entry Order (1)

MFC9760



Key & Button Entry Order (2)

3.8 Sensor Operational Check

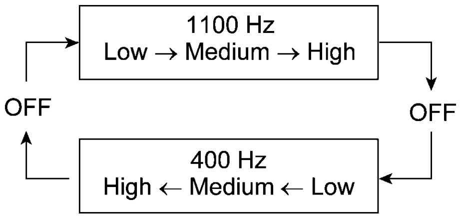
■ Function

This function allows you to check whether the 13 sensors--document front sensor, document rear sensor, cover sensor, registration sensor, toner sensor, paper ejection sensor, CCD HP sensor, manual insertion sensor, cassette sensor, jam sensor, document tray open sensor, 2nd registration sensor*, and 2nd cassette sensor*--operate correctly.

(*These sensors are provided for models supporting a 2nd paper cassette.)

■ Operating Procedure

(1) Press the **3** and **2** keys in this order in the initial stage of the maintenance mode. The machine beeps 1100 Hz and 400 Hz tones cyclically through the following volumes for testing the speaker.



NOTE: To stop beeping, press the **Menu** key.

If the sensing status are as listed below, the LCD will show the following two character strings (which can be switched by pressing the **Fax Start** key for machines w/ fax or the **Sort** key for machines w/o fax):

"DFDRCVRSTNPOFH   " and "MNCS   P2FC"
"DFDRCVRSTNPOFHR2" and "MNCSC2P2FC" on models having a 2nd paper cassette

Given below is the relationship between the LCD indication, sensor names and sensor status.

LCD	Sensors	Sensing status
DF	Document front sensor	No document detected.
DR	Document rear sensor	No document detected.
CV	Cover sensor	Front cover closed.
RS	Registration sensor	No paper detected.
TN	Toner sensor	No toner detected.
PO	Paper ejection sensor	No paper jam.
FH	CCD HP sensor	CCD unit placed in home position
R2	2nd registration sensor*	No paper detected.
MN	Manual insertion sensor	No paper detected.
CS	Cassette sensor	No paper cassette loaded.
C2	2nd cassette sensor*	No paper cassette loaded.
P2	Jam sensor	No paper jammed.
FC	Document tray open sensor	Document tray closed.

(*These indications will always be displayed in models not equipped with a 2nd paper cassette.)

(2) Change the detecting conditions (e.g., insert paper through the document sensors or the registration sensor(s), open the front cover, remove the toner cartridge, jam paper at the paper outlet, insert paper manually through the paper slot, and load the paper cassette(s)), and then check that the indication on the LCD changes according to the sensor states.

(3) To stop this operation and return the machine to the initial stage of the maintenance mode, press the **Stop** key.

NOTE: If you have opened and closed the front cover during the above procedure, you need to open and close the front cover again upon completion of the procedure.

3.9 CCD Scanner Area Setting

■ **Function**

The machine sets the CCD scanner area and stores it into the EEPROM.

■ **Operating Procedure**

(1) Press the **5** key twice in the initial stage of the maintenance mode.

The "SCANNER AREA SET," "BLACK LEVEL INIT," and "WHITE LEVEL INIT" will appear on the LCD in this order.

The machine checks and sets the area to be scanned.

If no error is noted, the machine returns to the initial stage of the maintenance mode.

If any error is noted, the "SCANNER ERROR" will appear on the LCD. To return the machine to the initial stage of the maintenance mode, press the **Stop** key.

3.10 EEPROM Customizing

■ **Function**

This function allows you to customize the EEPROM according to language, function settings, and firmware switch settings. The customizing codes list is given in Appendix 1.

NOTE: If you replace the main PCB, be sure to carry out this procedure.

■ **Operating Procedure**

(1) Press the **7** and **4** keys in this order in the initial stage of the maintenance mode.

The current customizing code (e.g., 9001 in the case of MFC9700 USA version) appears.

(2) Enter the desired customizing code (e.g., 0002 in the case of MFC9800 Canadian version).

The newly entered code appears.

NOTE: *If a wrong 4-digit code is entered, the machine will malfunction.*

(3) For machines w/ fax: Press the **Fax Start** key.
For machines w/o fax: Press the **Sort** key.

The machine saves the setting and returns to the initial stage of the maintenance mode.

If you press the **Stop** key or no keys are pressed for one minute in the above procedure, the machine stops the procedure and returns to the initial stage of the maintenance mode.

3.11 Erasure of Received FAX Messages Temporarily Stored in the Flash Memory (Not applicable to the American version)

■ Function

This function erases received FAX messages which are temporarily stored in the flash memory so that they will not be lost by powering off the equipment. This function also erases activity report data stored in the flash memory.

■ Operating Procedure

(1) Press the **7** and **9** keys in this order in the initial stage of the maintenance mode.

The machine shows the "BACKUP CLEAR" on the LCD and erases received FAX messages temporarily stored in the flash memory.

Upon completion of erasure, the machine will automatically return to the initial stage of the maintenance mode.

3.11A Display of the Equipment's Log Information

■ Function

The equipment may display its log information on the LCD.

■ Operating Procedure

(1) Press the **8** and **0** keys in this order in the initial stage of the maintenance mode.

The USB serial number appears on the LCD.

(2) For machines w/ fax: Press the **Fax Start** key.
For machines w/o fax: Press the **Sort** key.

Each time the **Fax Start** or **Sort** key is pressed, one of the following log information items appears on the LCD in the order given below.

1) ID code assigned to the facsimile machine
2) Jam count, indicating how many times a paper jam has been occurred
3) Page count, indicating how many pages the current drum has been printed
4) Total page count, indicating how many pages the equipment has been printed since produced
5) Drum count, indicating how many times the drum has been rotated
6) Drum change count, indicating how many times drum replacement has been made
7) Toner change count, indicating how many times toner replacement has been made
8) Copy page count, indicating how many copies have been made (This item will not appear on the MFC9700 Ver. A to D and the MFC9800 Ver. A and B.)
9) PC print page count, indicating how many pages the equipment has been printed as an output device of the connected PC (This item will not appear on the MFC9700 Ver. A to D and the MFC9800 Ver. A and B.)
10) FAX page count, indicating how many received FAX pages have been printed (This item will not appear on the MFC9700 Ver. A to D and the MFC9800 Ver. A and B.)
11) Error code of the most recent machine error*[1]
12) Error code of the most recent communications error*[2]
13) ADF jam count, indicating how many times a document jam has been occurred
14) ADF page count, indicating how many documents have been fed

(3) To stop this operation and return to the equipment to the initial stage of the maintenance mode, press the **Stop** key.

*[1] When a machine error is displayed, pressing the **Menu** key toggles between the latest error and 2nd latest error.

*[2] When a communications error is displayed, pressing the **Menu** key cycles through the latest error, 2nd latest error, and 3rd latest error.

3.12 Machine Error Code Indication

■ **Function**

This function displays an error code of the last error on the LCD.

■ **Operating Procedure**

(1) Press the **8** and **2** keys in this order in the initial stage of the maintenance mode.

The LCD shows the "MACHINE ERROR X X."

(2) To stop this operation and return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

3.13 Output of Transmission Log to the Telephone Line (Not applicable to machines w/o fax)

■ **Function**

This function outputs the transmission log (that the machine has stored about the latest transmission) to the telephone line. It allows the service personnel to receive the transmission log of the user's machine at a remote location and use it for analyzing problems arising in the user's machine.

■ **Operating Procedure**

(1) If the user's machine has a transmission-related problem, call the user's machine at a remote location from your machine.

(2) If the line is connected, have the user perform the following:

1) Press the **Menu**, **Resolution**, and **0** keys in this order.

2) Press the **8** and **7** keys.

The above operation makes the user's machine send CNG to your machine for sending the transmission log.

(3) If you hear the CNG sent from the user's machine, press the **Fax Start** key of your machine.

Your machine will start to receive the transmission log from the user's machine.

3.14 Cancellation of the Memory Security Mode (Not applicable to the American version or machines w/o fax)

■ **Function**

This procedure can cancel the memory security mode. Use this procedure if the user forgets his/her password entered when setting the memory security mode so as not to exit from the memory security mode.

NOTE: Carrying out this procedure will lose passwords previously entered but retain FAX messages received in the memory security mode.

■ **Operating Procedure**

(1) When the SECURE MODE is displayed on the LCD, hold down the **Menu** key and press the **#** key. Within two seconds, start to press the **2**, **7**, **9**, **0**, and **0** keys.

The memory security mode will be canceled and the machine returns to the calendar clock screen.

CHAPTER VI.

ERROR INDICATION AND TROUBLESHOOTING

CHAPTER VI. ERROR INDICATION AND TROUBLESHOOTING

CONTENTS

1. ERROR INDICATION VI-1

1.1 Machine Errors VI-1

[1] Error messages on the LCD VI-1

[2] Error codes shown in the "MACHINE ERROR X X" message VI-5

1.2 Communications Errors (Not applicable to machines w/o fax) VI-7

2. TROUBLESHOOTING VI-17

2.1 Introduction VI-17

2.2 Precautions VI-17

2.3 Checking prior to Troubleshooting VI-17

2.4 Troubleshooting Procedures VI-19

[1] Control panel related VI-19

[2] Telephone related VI-19

[3] Communications related VI-20

[4] Paper/document feeding related VI-20

[5] Print-image related VI-21

[6] PC-driven or video capture-driven printing VI-27

Location of High-voltage Contacts and Grounding Contacts VI-28

1. ERROR INDICATION

To help the user or the service personnel promptly locate the cause of a problem (if any), the machine incorporates the self-diagnostic functions which display error messages for machine errors and communications errors. (Note that machines w/o fax do not support error messages for communications errors.)

For the communications errors, the machine also prints out the transmission verification report and the communications list.

1.1 Machine Errors

If a machine error occurs, the machine emits an audible alarm (continuous beeping) for approximately 4 seconds and shows the error message on the LCD. For the error messages, see [1] below.

To display detailed error information, use the maintenance-mode function code 82 described in Chapter V, Section 3.12 (that is, make the machine enter the maintenance mode and then press the **8** and **2** keys). Following the MACHINE ERROR, one of the error codes listed in [2] will appear on the LCD.

[1] Error messages on the LCD

Messages on the LCD	Probable Cause
CHANGE DRUM SOON	The service life of the drum unit will expire soon. This message appears for one minute. (You can turn this message indication on or off by the maintenance-mode function code 10, WSW31, selector 8. Refer to Chapter V, Section 3.5.)
(In the 1st row) * CHECK CASSETTE CHECK CASSETTE#1 CHECK CASSETTE#2 (In the 2nd row) Reinstall cassette properly.	The cassette sensor detects that no paper cassette is loaded. (For those models available with a 2nd paper cassette, the "CHECK CASSETTE#1" or "CHECK CASSETTE#2" will appear if the cassette sensor or the 2nd cassette sensor does not detect paper cassette, respectively. If both sensors detect no cassette, the "CHECK CASSETTE" will appear.)
CHECK PAPER CHECK PAPER#1 CHECK PAPER#2 RELOAD PAPER (These messages appear alternately.)	Even after paper pick-up operation, the manual insertion sensor does not detect paper. (For those models available with a 2nd paper cassette, the "CHECK PAPER#1" or "CHECK PAPER#2" will appear if the manual insertion sensor or 2nd registration sensor does not detect paper, respectively. If both sensors detect no paper, the "CHECK PAPER" will appear.)
(In the 1st row) * CHECK SCAN LOCK (In the 2nd row) Release scanner lock lever, then press STOP KEY.	The output of the CCD HP sensor does not change because: 1) The CCD lock is placed in the lock (backward) position, 2) The CCD HP sensor is defective, or 3) The CCD motor is defective.

*On machines equipped with a single-row LCD, these messages appear alternately.

Messages on the LCD	Probable Cause
CLEAN UP SCANNER	In the scanning compensation data list printed by the maintenance-mode function code 05 (refer to Chapter V, Section 3.2), less than fifty percent of the white level data is faulty. (This message may appear only in the maintenance mode.)
COOLING DOWN WAIT FOR A WHILE (These messages appear alternately.)	The controller, which monitors the internal resistance of the in-casing temperature sensor (thermistor) and heater thermistor, has detected that the temperature inside the machine or the heater temperature exceeded the specified level. If either temperature exceeds the preset level, recording is no longer possible.
COVER OPEN PLS CLOSE COVER (These messages appear alternately.)	The cover sensor detects that the front cover is not closed.
(In the 1st row) * CHECK DOCUMENT CHECK ORIGINAL (In the 2nd row) Remove document, then press STOP KEY.	■ Document jam (1) The document length exceeds the limitation (400 or 90 cm) registered by firmware switch WSW16. (Refer to Chapter V, Section 3.5.) (Both the document front and rear sensors stay ON after the document has been fed by the registered length.) (2) The document rear sensor detects no trailing edge of a document after the document has been fed by 400 cm. (The document rear sensor stays ON even after the document has been fed when the document front and rear sensors were OFF and ON, respectively.)
	■ Document loading error (1) The document rear sensor detects no leading edge of a document within 10 seconds from the start of document loading operation. (The document rear sensor stays OFF even after the document has been fed when the document front sensor was ON.) (2) The loaded document is too short. (Since the document is shorter than the distance between the document front and rear sensors, the document front sensor is turned OFF before the document rear sensor is turned ON.)
(In the 1st row) * CHECK ROM VER (In the 2nd row) NC-8100h firmware update req'd: Visit web site.	An optional LAN card (NC-8100h) is newly installed to the machine. However, the current firmware in the machine cannot support the optional LAN card. You need to update the firmware.

*On machines equipped with a single-row LCD, these messages appear alternately.

Messages on the LCD	Probable Cause
(In the 1st row) * MACHINE ERROR XX (In the 2nd row) Unplug machine, then call Brother	"XX" indicates an error code. Refer to [2] on pages VI-5 and VI-6.
(In the 1st row) * PLS CLEAN DRUM (In the 2nd row) Clean corona wire of drum unit	In either of the following cases, this message appears, prompting the user to clean the corona wire of the laser-sensitive drum. - When the specified number of pages has been printed after the replacement of the laser-sensitive drum. - When the corona wire abnormally emits ions. (This happens if the corona wire becomes dirty, superimposing noise components on toner sensor signals.)
PLS OPEN COVER	To display the relating detailed error code, use maintenance-mode function code 82. (Refer to Chapter V, Section 3.12.) If this message appears, open and close the front cover. The message may disappear if opening/closing the front cover removes the error. If the error persists, the "MACHINE ERROR XX" will appear.
(In the 1st row) * PAPER JAM (In the 2nd row) Open cover, then remove jammed paper.	(1) The paper ejection sensor stays OFF even after the registration sensor has gone OFF and the paper has been fed by the specified amount. (2) The paper ejection sensor stays ON even after it has came ON and the paper has been fed by the specified amount.
(In the 1st row) * PC BUSY OR FAIL (In the 2nd row) Check PC cable, then press STOP KEY.	The machine has failed to communicate with the host computer.
PLEASE WAIT ** SCAN LAMP WARMUP	After the fluorescent lamp in the CCD unit had been OFF, the scanning operation got started. Until the fluorescent lamp becomes stabilized in lighting, the scanning operation will be delayed.
SCANNER ERROR	In the scanning compensation data list printed by the maintenance-mode function code 05 (refer to Chapter V, Section 3.2), fifty percent or more of the white level data is faulty. (This message may appear only in the maintenance mode.)

*On machines equipped with a single-row LCD, these messages appear alternately.

**On machines equipped with a single-row LCD, the "SCAN LAMP WARMUP" only appears.

Messages on the LCD	Probable Cause
(In the 1st row) * TONER EMPTY (In the 2nd row) Open cover, then replace new toner cartridge	The toner sensor has detected that there is no toner in the cartridge or that no toner cartridge is loaded. If this message appears, recording is no longer possible.
TONER LOW	The toner sensor has detected that there is not enough toner.

*On machines equipped with a single-row LCD, these messages appear alternately.

If only an alarm beep is heard without any message on the LCD when the machine is powered up, the ROM or RAM will be defective.

[2] Error codes shown in the "MACHINE ERROR X X " message

Error Code X X (Hex.)	Error factor
(71	Polygon motor does not synchronize with the reference clock.)
(72	Cannot detect Beam Detect signal.)
(74	Toner empty.)
(75	In-casing temperature error.)
(76	Heater harness disconnected or broken. Or heater thermistor harness disconnected or broken when the power is turned on, the front cover is opened and closed, or the machine exits from the sleep mode.)
(77	Power turned off and on at the occurrence of error 76 or 78.)
(78	Heater thermistor short-circuited. Or heater thermistor harness disconnected or broken when the machine is on standby.)
(79	In-casing temperature sensor harness disconnected or broken.)
(7A	Main motor does not synchronize with the reference clock.)
(7B	ASIC error on the main PCB.)
(7C	Engine PCB error.)
(80	Paper size setting error.)
(82	Paper feeding error.)
(83	Paper jam. The registration sensor, 2nd registration sensor, and/or manual insertion sensor remains ON.)
(84	Paper jam. The paper ejection sensor remains ON.)
(85	No paper cassette loaded.)
(86	No 2nd paper cassette loaded.)
(88	Paper jam. Even after the registration sensor has gone OFF, the paper ejection sensor still stays OFF.)
(A1	Front cover opened.)
(A2	Document too long to scan.)
(A3	Document not detected by the document rear sensor.)
(A4	50% or more faulty of white level data.)
(AC	Less than 50% faulty of white level data.)

Error codes in parentheses do not appear in the "MACHINE ERROR X X", since those errors are displayed as messages described in "[1] Error messages on the LCD." In the maintenance mode (Function code 82), those error codes may be displayed.

Error Code X X (Hex.)	Error factor
(AE	The CCD HP sensor sticks to OFF, indicating that the CCD unit has not returned to the home position.)
(AF	The CCD HP sensor sticks to ON, indicating that the CCD unit has stayed in the home position.)
(B1	Dark level offset data error.)
(B2	Gain control data error.)
(B3	Scan area left edge detection error.)
(B4	Scan area right edge detection error.)
(B7	A/D converter reference voltage error (at High level).)
(B8	A/D converter reference voltage error (at Low level).)
(BA	Magnification error for substantial white level data.)
(BB	Substantial white level data error in black & white mode.)
(BC	Substantial white level data error in photo mode.)
(BD	Black level data error.)
(BE	Detection error of black markings given on the white-level reference film.)
(BF	Detection error of ADF scanning position.)
(D*	Modem error.)
(E4	Out of recording paper.)
E6	Write error in EEPROM.
(E8	Data scanning error during transmission.)
(EA	Document removed in phase B.)
(F5	EOL not found in page memory transmission mode.)
(F6	PC interface error.)
(FF	Fatal error.)

Error codes in parentheses do not appear in the "MACHINE ERROR X X", since those errors are displayed as messages described in "[1] Error messages on the LCD." In the maintenance mode (Function code 82), those error codes may be displayed.

1.2 Communications Errors (Not applicable to machines w/o fax)

If a communications error occurs, the machine

① emits an audible alarm (intermittent beeping) for approximately 4 seconds,

② displays the corresponding error message, and

③ prints out the transmission verification report if the machine is in sending operation.

■ Definition of Error Codes on the Communications List

(1) Calling

Code 1	Code 2	Causes
10	08	Wrong number called.
10	20	Retrieval file error.
10	21	Image data entry error.
11	01	No dial tone detected before start of dialing.
11	02	Busy tone detected before dialing.
11	03	2nd dial tone not detected.
11	05	No loop current detected.*
11	06	Busy tone detected after dialing or called.
11	07	No response from the remote station in sending.
11	10	No tone detected after dialing.
17	07	No response from the calling station in receiving.
1A	01	Calling impossible due to memory full.

*Available in German versions only.

(2) Command reception

Code 1	Code 2	Causes
20	01	Unable to detect a flag field.
20	02	Carrier was OFF for 200 ms or longer.
20	03	Abort detected ("1" in succession for 7 bits or more).
20	04	Overrun detected.
20	05	A frame for 3 seconds or more received.
20	06	CRC error in answerback.
20	07	Undefined command received.
20	08	Invalid command received.
20	09	Command ignored once for document setting or for dumping-out at turn-around transmission.
20	0A	T5 timeout error
20	0B	CRP received.

Code 1	Code 2	Causes
20	0C	EOR and NULL received.
20	0D	Effective command not received.
20	10	Unable to reserve a command receiver memory.
20	11	Image data file error.

(3) Compatibility [checking the NSF and DIS]

Code 1	Code 2	Causes
32	01	Remote terminal only with V.29 capability in 2400 or 4800 bps transmission.
32	02	Remote terminal not ready for polling.
32	10	Remote terminal not equipped with password function or its password switch OFF.
32	11	Remote terminal not equipped with or not ready for confidential mailbox function.
32	12	Remote terminal not equipped with or not ready for relay broadcasting function.
32	13	No confidential mail in the remote terminal.
32	14	The available memory space of the remote terminal is less than that required for reception of the confidential or relay broadcasting instruction.

(4) Instructions received from the remote terminal [checking the NSC, DTC, NSS, and DCS]

Code 1	Code 2	Causes
40	02	Illegal coding system requested.
40	03	Illegal recording width requested.
40	05	ECM requested although not allowed.
40	06	Polled while not ready.
40	07	No document to send when polled.
40	10	Nation code or manufacturer code not coincident.
40	11	Unregistered group code entered for relay broadcasting function, or the specified number of broadcasting subscribers exceeding the limit.
40	12	Retrieval attempted when not ready for retrieval.
40	13	Polled by any other manufacturers' terminal while waiting for secure polling.
40	17	Invalid resolution selected.

(5) Command reception [checking the NSF and DIS after transmission of NSS and DCS]

Code 1	Code 2	Causes
50	01	Vertical resolution capability changed after compensation of background color.

(6) ID checking

Code 1	Code 2	Causes
63	01	Password plus "lower 4 digits of telephone number" not coincident.
63	02	Password not coincident.
63	03	Polling ID not coincident.
63	04	Entered confidential mailbox ID uncoincident with the mailbox ID.
63	05	Relay broadcasting ID not coincident.
63	06	Entered retrieval ID uncoincident with that of the mailbox ID.

(7) DCN reception

Code 1	Code 2	Causes
74		DCN received.

(8) TCF transmission/reception

Code 1	Code 2	Causes
80	01	Fallback impossible.

(9) Signal isolation

Code 1	Code 2	Causes
90	01	Unable to detect video signals and commands within 6 seconds after CFR is transmitted.
90	02	Received PPS containing invalid page count or block count.

(10) Video signal reception

Code 1	Code 2	Causes
A0	03	Error correction sequence not terminated even at the final transmission speed for fallback.
A0	11	Receive buffer empty. (5-second time-out)
A0	12	Receive buffer full during operation except receiving into memory.
A0	13	Decoding error continued on 500 lines.
A0	14	Decoding error continued for 10 seconds.
A0	15	Timeout: Five seconds or more for one-line transmission.
A0	16	RTC not found and carrier OFF signal detected for 6 seconds.
A0	17	RTC found but no command detected for 60 seconds.
A0	18	Receive buffer full during receiving into memory.
A0	19	Unable to obtain compressed image data to be sent in phase C.
A8	01	RTN, PIN, or ERR received at the calling terminal.*
A9	01	RTN, PIN, or ERR received at the called terminal.*

* Available in German versions only

(11) General communications-related

Code 1	Code 2	Causes
B0	02	Unable to receive the next-page data.
B0	03	Unable to receive polling even during turn-around transmission due to call reservation.
B0	04	PC interface error.
BF	01	Transmission canceled by pressing the **Stop** key (before completion of the G3 FAX negotiation).
BF	02	Transmission canceled by pressing the **Stop** key (after completion of the G3 FAX negotiation).
BF	03	Transmission canceled due to a scanning error.

(12) Transmission in V. 34 mode

Code 1	Code 2	Causes
C0	01	No common modulation mode or failed to poll.
C0	02	Unable to detect JM.
C0	03	Unable to detect CM.
C0	04	Unable to detect CJ.
C0	10	Cannot finish V. 34 negotiation or training.
C0	11	Modem error detected during V. 34 negotiation or training. (For modem error details, refer to the table below.)
C0	20	Modem error detected during sending of commands. (For modem error details, refer to the table below.)
C0	21	Modem error detected during receiving of commands. (For modem error details, refer to the table below.)
C0	22	Control channel connection time-out.
C0	30	Modem error detected during sending of video signals. (For modem error details, refer to the table below.)
C0	31	Modem error detected during receiving of video signals. (For modem error details, refer to the table below.)

Modem error details (Code 3)

Code 3	Causes
21	Timeout waiting for INFO0.
22	Checksum error in INFO0.
23	Timeout waiting for tone A or B.
24	Timeout waiting for first phase reverse.
25	Timeout waiting for probing cut-off tone.
26	Timeout waiting for second phase reverse.
27	Timeout waiting for end of probing.
28	Timeout waiting for third phase reverse.
29	Timeout waiting for INFO1.
2A	Checksum error in INFO1.
2B	Tone detected preceding INFO0.
2C	Unexpected INFO0 detected.
31	Timeout waiting for turning off the receive control channel.
91	Error occurred in the first CC train.
92	Timeout waiting for PPh.
93	Tone A/B detected in the CC retrain.
94	Timeout waiting for ALT.
95	ACh found.
96	FED turned off during reception of CC data.
97	Timeout waiting for turning off the CC.
A1	Retraining forced for problems not fixed in phase 2.
B0	Problem with S-sequence of HDX-resync.
B1	FED turned off in the S-sequence of HDX-resync.
B2	S-sequence finished before prediction in HDX-resync.
B3	Timeout waiting for S-Sbar in HDX-resync.
B4	Timeout waiting for S-Sbar in HDX-resync.
B5	Timeout waiting for S in HDX-resync.
B6	Timeout waiting for synchronization with PP.
C0	Problem with S-sequence in phase 3.
C1	FED turned off in the S-sequence in phase 3.

Code 3	Causes
C2	S-sequence finished before prediction in phase 3.
C3	Timeout waiting for S-Sbar in phase 3.
C4	Timeout waiting for S-Sbar in phase 3.
C5	Timeout waiting for S in phase 3.
C7	Training after TRN failure.
D0	Problem with S-sequence in phase 4.
D1	FED turned off in S-sequence in phase 4.
D2	S-sequence finished before prediction in phase 4.
D3	Timeout waiting for S-Sbar in phase 4.
D4	Timeout waiting for S-Sbar in phase 4.
D5	Timeout waiting for S in phase 4.
D6	Timeout waiting for MP.
D8	Timeout waiting for E.
DA	Timed out in re-negotiation of the transmitter rate.
DB	Timed out in the transmitter MPh.
E2	Retraining detected in phase 2.
E3	Retraining detected in phase 3.
E4	Retraining detected in phase 4.
FE	DTR turned off during retraining.
FF	Tx set-abort flag.
71	Did not write onto the first mapping frame.

(13) Maintenance mode

Code 1	Code 2	Causes
E0	01	Failed to detect 1300 Hz signal in burn-in operation.
E0	02	Failed to detect PB signals in burn-in operation.
E0	03	Failed to detect commands from the RS-232C in burn-in operation.

(14) Machine error

Code 1	Code 2	Causes
FF	00	Burn-in operation canceled by pressing the **Stop** key.
FF	FF	Unrecoverable MODEM error.

2. TROUBLESHOOTING

2.1 Introduction

This section gives the service personnel some of the troubleshooting procedures to be followed if an error or malfunction occurs with the machine. It is impossible to anticipate all of the possible problems which may occur in future and determine the troubleshooting procedures, so this section covers some sample problems. However, those samples will help service personnel pinpoint and repair other defective elements if he/she analyzes and examines them well.

2.2 Precautions

Be sure to observe the following to prevent the secondary troubles from happening:

(1) Always unplug the AC power cord from the outlet when removing the covers and PCBs, adjusting the mechanisms, or conducting continuity testing with a circuit tester.

(2) When disconnecting the connectors, do not pull the lead wires but hold the connector housings.

(3) • Before handling the PCBs, touch a metal portion of the machine to discharge static electricity charged in your body.

• When repairing the PCBs, handle them with extra care.

After repairing the defective section, be sure to check again if the repaired section works correctly. Also record the troubleshooting procedure so that it would be of use for future trouble occurrence.

2.3 Checking prior to Troubleshooting

Prior to proceeding to the troubleshooting procedures given in Subsection 2.4, make the following initial checks:

<u>Environmental conditions</u>

Check that:

(1) The machine is placed on a flat, firm surface.

(2) The machine is used in a clean environment at or near normal room temperature (10°C to 32.5°C) with normal relative humidity (20 to 80%).

(3) The machine is not subjected to rapid change of the ambient temperature. (Moving the machine from a cold place to warm place will cause condensation inside the machine. If it takes place, leave the machine in the warm place for approx. two hours before turning on the power.) Turning the machine on with dew condensation will result in damaged electronic devices.

(4) The machine is not exposed to direct sunlight or harmful gases.

<u>Power requirements</u>

Check that:

(1) The power supply specified on the rating plate located on the bottom of the machine is used. The supply voltage stays within the rating ±10%.

(2) Each voltage level on AC input lines and DC lines is correct.

(3) All cables and harnesses are firmly connected.

(4) None of the fuses are blown.

Recording paper

Check that:

(1) A recommended type of recording paper is used.

(2) The recording paper is not dampened.

2.4 Troubleshooting Procedures

[1] Control panel related

Trouble	Check:
(1) LCD shows nothing.	• Panel harness between the control panel PCB and relay PCB • Main-relay (panel) harness between the relay PCB and main PCB • Control panel PCB • Low-voltage power supply PCB • Main PCB • LCD
(2) Control panel inoperative.	• Panel harness between the control panel PCB and relay PCB • Main-relay (panel) harness between the relay PCB and main PCB • Control panel PCB • FPC key • Main PCB

[2] Telephone related

Trouble	Check:
(1) No phone call can be made.	• FPC key • Control panel PCB • NCU PCB • Main PCB
(2) Speed dialing or one-touch dialing will not work.	• Ordinary dialing function (other than the speed and one-touch dialing) If it works normally, check the main PCB; if not, refer to item (1) above.
(3) Speaker silent during on-hook dialing.	• Ordinary dialing function (other than the on-hook dialing with the hook key) If it works normally, proceed to the following checks; if not, refer to item (1) above.
(4) Dial does not switch between tone and pulse.	• Main PCB
(5) Telephone does not ring.	• Speaker • NCU PCB • Main PCB

[3] Communications related

Trouble	Check:
(1) No tone is transmitted.	• Main PCB • NCU PCB

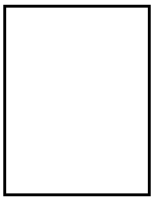
[4] Paper/document feeding related

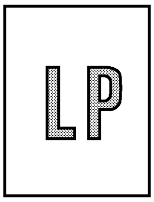
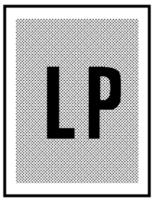
Trouble	Check:
(1) Neither "COPY: PRESS COPY" nor "FAX: NO. & START" message appears although documents are set.	• Sensors by using the maintenance-mode function code 32. (Refer to Chapter V, Subsection 3.8.) • Document front sensor actuator and document rear sensor actuator • Main PCB
(2) Document not fed.	• ADF and its related sections • ADF motor and its harness • Document feed roller and its related gears • Main PCB
(3) Document double feeding	• ADF parts
(4) Document jam	• ADF motor
(5) Recording paper not fed.	• Paper loaded in the paper cassette(s) • Paper cassette(s) • Drum unit • Heat-fixing unit • Drive gear ASSY • Engine PCB • Main PCB
(6) Recording paper double feeding	• Separation pad on the paper cassette(s)

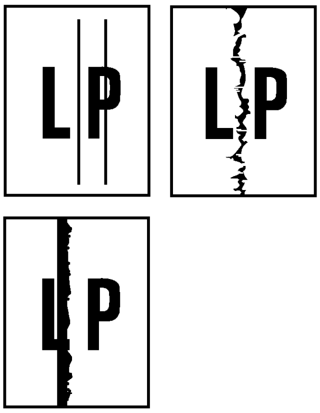
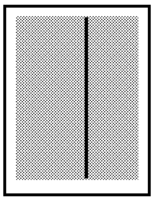
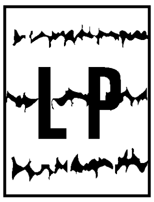
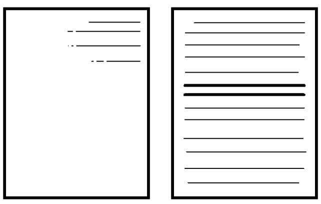
[5] Print-image related

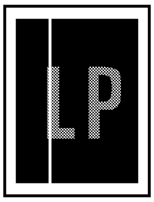
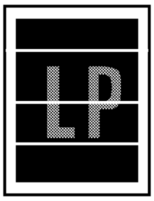
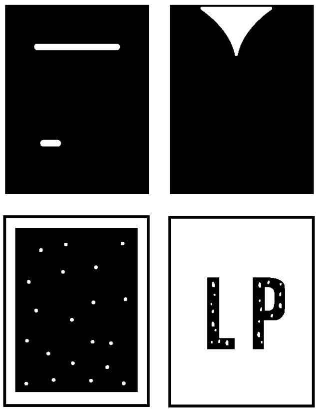
If the received or sent image has any problem, first make a copy with the machine.

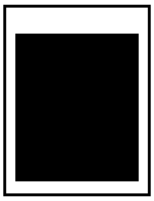
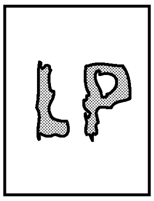
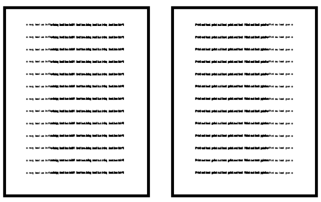
If the copied image is normal, the problem may be due to the remote terminal; if it is abnormal, proceed to the following checks:

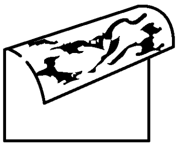
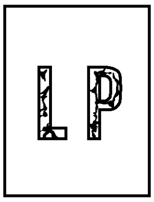
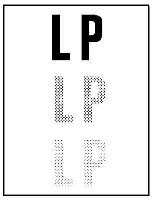
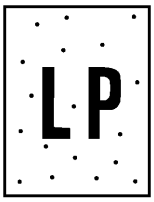
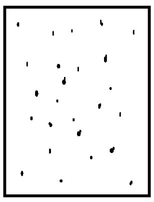
Trouble	Action to be taken
(1) Completely blank 	<u>At the scanner</u> Check the following components: - CCD flat cable - CCD unit - Main PCB <u>At the printer side</u> ● Clean the high-voltage contacts for the developer roller on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ③ in the illustration given on page VI-28) ● Clean the grounding contacts on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ① in the illustration given on page VI-28) ● Replace the toner cartridge. ● Replace the drum unit. ● Check the connection of the laser flat cable on the main PCB. ● Replace the main PCB. ● Replace the laser unit. ● Replace the high-voltage power supply PCB.
(2) All black 	<u>At the scanner</u> Check the following components: - CCD flat cable - CCD unit - Main PCB <u>At the printer side</u> ● Clean the high-voltage contacts for the grid and charger on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ④ and ② in the illustration given on page VI-28) ● Clean the charger (corona wires) itself. ● Check the connection of the laser flat cable on the main PCB. ● Replace the drum unit. ● Replace the high-voltage power supply PCB. ● Replace the main PCB.

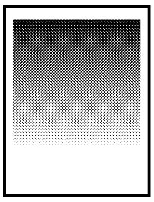
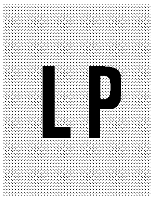
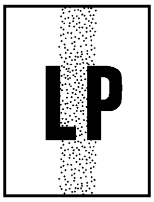
Trouble	Action to be taken
(3) Light 	<u>At the scanner</u> Check the following components: - CCD unit - Main PCB <u>At the printer side</u> ● Replace the toner cartridge with a new one and print 4 to 5 pages. If the problem persists, proceed to the next step. ● Remove the toner cartridge and start printing. If printing takes place, clean the toner sensors (LED and light-receiver), check the sensor harnesses, and then replace the toner sensor PCBs. ● Clean the high-voltage contacts for the transfer roller on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ⑤ in the illustration given on page VI-28) ● Clean the high-voltage contacts for the developer roller on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ③ in the illustration given on page VI-28) ● Clean the grounding contacts on the drum unit and main cover. (Contacts ① in the illustration given on page VI-28) ● Check the connection of the main PCB and high-voltage power supply PCB. ● Replace the drum unit. ● Replace the high-voltage power supply PCB. ● Replace the engine PCB. ● Replace the main PCB. ● Replace the laser unit.
(4) Dark 	<u>At the scanner</u> Check the following components: - CCD unit - Main PCB <u>At the printer side</u> ● Slide the wire cleaner to clean the corona wire inside the drum unit. ● Clean the high-voltage contacts for the grid and charger on the drum unit, main cover, and high-voltage power supply PCB. (Contacts ④ and ② in the illustration given on page VI-28) ● Replace the toner cartridge. ● Replace the drum unit. ● Replace the high-voltage power supply PCB. ● Replace the main PCB. ● Replace the engine PCB.

Trouble	Action to be taken
(5) Black and blurred vertical stripes or band 	<u>At the scanner</u> Check the following components: - CCD unit <u>At the printer side</u> ● Clean the paper path which may be contaminated with toner. ● Slide the wire cleaner to clean the corona wire inside the drum unit. ● Make sure that the wire cleaner is returned to its home position. ● Replace the toner cartridge. ● Replace the drum unit. ● Replace the heat-fixing unit.
(6) Black vertical streaks on gray background 	<u>At the printer side</u> ● Clean the laser beam window (glass) on the laser unit. ● Replace the laser unit.
(7) Black and blurred horizontal stripes 	<u>At the printer side</u> ● Slide the wire cleaner to clean the corona wire inside the drum unit. ● If the horizontal stripes appear at 39-mm intervals, replace the toner cartridge. ● If they appear at 94-mm intervals, replace the drum unit. ● If they appear at 79-mm intervals, replace the heat-fixing unit. ● Clean the grounding contacts. (Contacts ① in the illustration given on page VI-28.) ● Replace the high-voltage power supply PCB.
(8) Horizontal lines 	<u>At the printer side</u> ● Check the connection between the right end of the paper feed roller and the grounding wire. (Contact ⑦ in the illustration given on page VI-29.)

Trouble	Action to be taken
(9) White vertical streaks 	<u>At the scanner</u> Check the following components: - CCD unit <u>At the printer side</u> ● Clean the laser beam window on the laser unit. ● Replace the toner cartridge. ● Replace the drum unit.
(10) White horizontal stripes 	<u>At the printer side</u> ● Replace the drum unit.
(11) Dropout, white spots, or hollow print 	<u>At the printer side</u> ● Check the connection of the main PCB and high-voltage power supply PCB. ● Replace the toner cartridge. ● Gently wipe off the surface of the photo-sensitive drum with a cotton swab. ● Replace the drum unit. ● Replace the high-voltage power supply PCB.

Trouble	Action to be taken
(12) Faulty image registration (Leading edge of image starts too late on paper) 	<u>At the printer side</u> ● Instruct the user not to load paper exceeding the limit on the paper cassette(s). ● Instruct the user to use the recommended types of paper. ● Replace the paper cassette(s). ● Check the position of the registration sensor. ● Replace the drive gear ASSY.
(13) Image distortion or improper image alignment 	<u>In communications</u> Check the following components: - Error code displayed. (Refer to Section 1, "ERROR INDICATION" in this chapter.) - NCU PCB - Main PCB <u>At the scanner</u> Check the following components: - ADF unit - CCD motor and its harness - Main PCB <u>At the printer side</u> ● Check that the laser unit is secured with the screws without looseness. ● Check the connection of the polygon motor harness on the engine PCB. ● Check the connection of the laser flat cable on the main PCB. ● Replace the laser unit.
(14) Blurred at either side 	<u>At the printer side</u> ● Check that the machine is placed on a flat surface. ● Shake the toner cartridge horizontally. If the problem persists, replace it. ● Clean the laser beam window (glass) on the laser unit. ● Replace the laser unit.

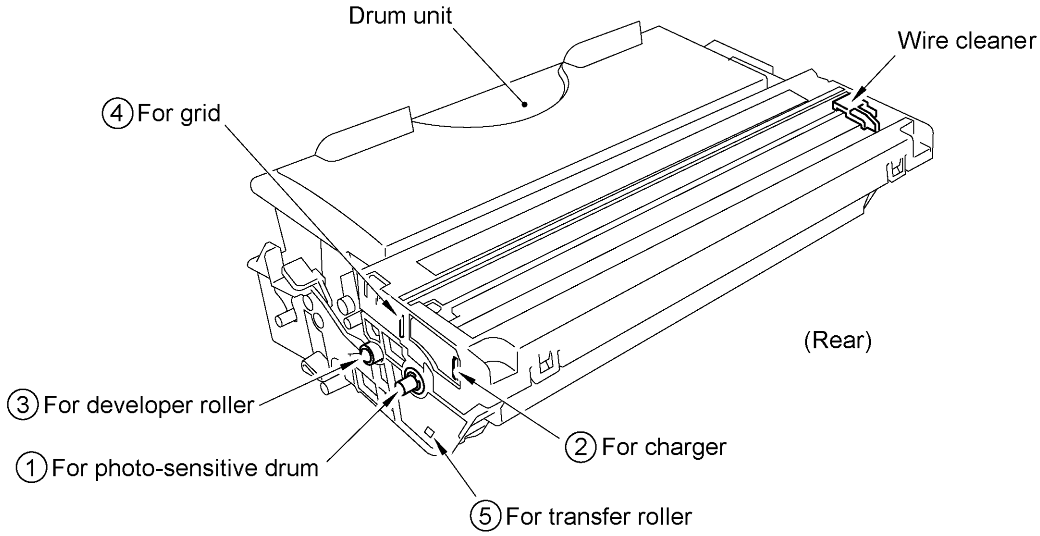
Trouble	Action to be taken
(15) Dirt back of paper 	At the printer side ● Clean the pressure roller in the heat-fixing unit. Replace the heat-fixing unit. ● Replace the drum unit. ● Replace the high-voltage power supply PCB.
(16) Poor fixing 	At the printer side ● Instruct the user to use paper of the recommended weight (less than 36 lb./m^2). ● Clean the toner sensors (LED and light-receiver). ● Replace the toner cartridge. ● Replace the drum unit. ● Check the fitting of the heater thermistor. Replace the heat-fixing unit. ● Replace the low-voltage power supply PCB.
(17) Ghost 	At the printer side ● Instruct the user to use paper of the recommended weight (less than 36 lb./m^2). ● Replace the drum unit. ● Replace the high-voltage power supply PCB.
(18) Black spots 	At the printer side ● Gently wipe off the surface of the photo-sensitive drum with a cotton swab. ● Replace the drum unit. ● Replace the heat-fixing unit. ● Replace the high-voltage power supply PCB.
(19) Light rain 	At the printer side ● Replace the drum unit. ● Replace the high-voltage power supply PCB.

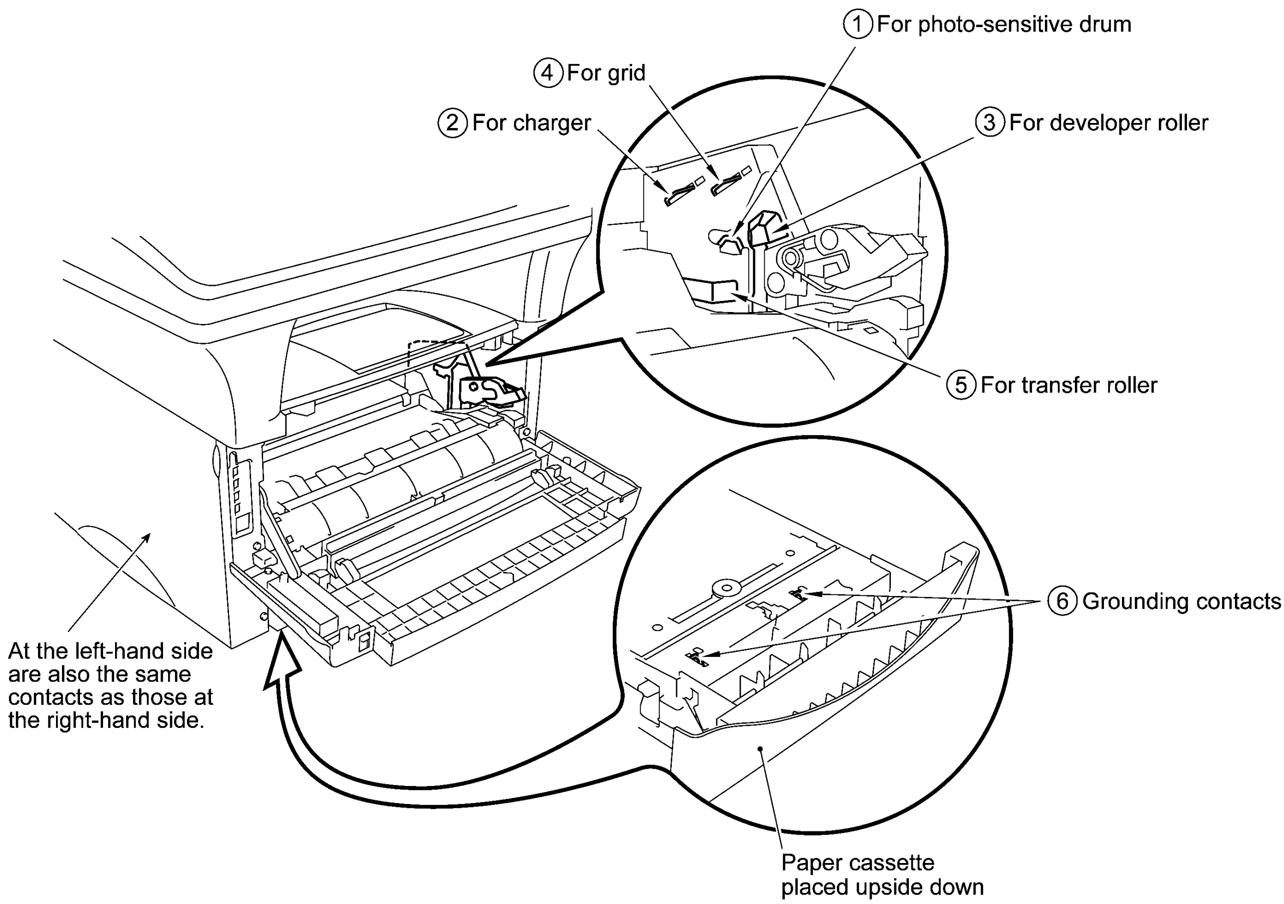
Trouble	Action to be taken
(20) Fading (black to white) 	<u>At the printer side</u> ● Replace the toner cartridge. ● Replace the high-voltage power supply PCB.
(21) Gray background 	<u>At the printer side</u> ● Instruct the user to use paper of the recommended weight (less than 36 lb./m^2). ● Clean the toner sensors (LED and light-receiver). ● Check the toner sensor harnesses. ● Replace the toner cartridge. ● Replace the drum unit. ● Replace the high-voltage power supply PCB.
(22) Toner specks 	<u>At the printer side</u> ● Instruct the user to use paper of the recommended weight (less than 36 lb./m^2). ● Replace the toner cartridge. ● Replace the drum unit.

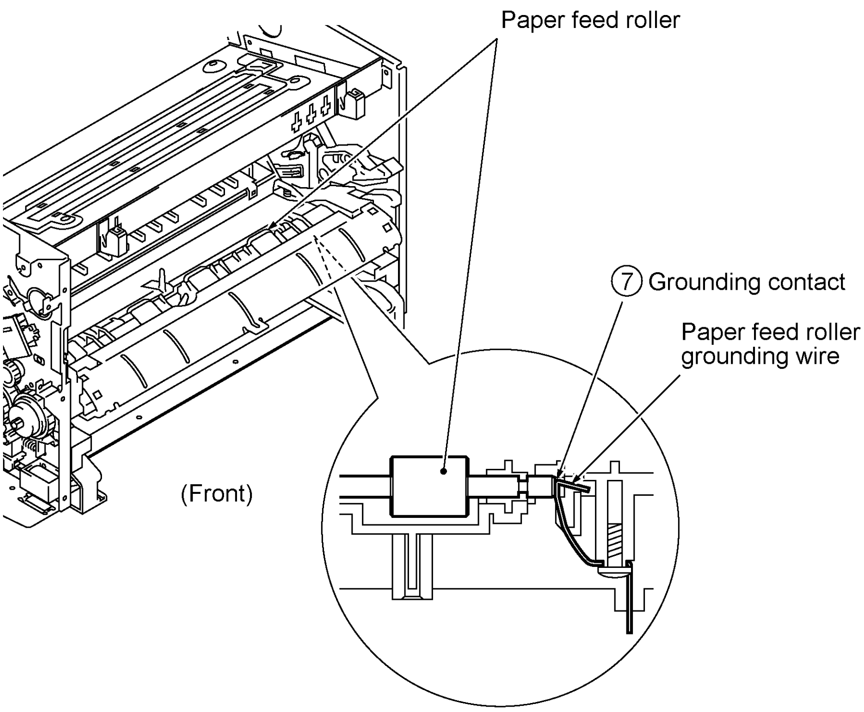
[6] PC-driven or video capture-driven printing

Trouble	Check:
(1) PC-driven printing is impossible.	• Interface with the host computer • PC interface cable • Main PCB • Centronics interface
(2) Video capture-driven printing is impossible	• VC connector PCB • Main PCB • Centronics interface
(3) Video printing is impossible.	• VC connector PCB • Main PCB

Location of High-voltage Contacts and Grounding Contacts







Viewed from the bottom

MFC9800/MFC9700/DCP1400
MFC9880/MFC9860/MFC9760

Appendix 1. EEPROM Customizing Codes

EEPROM Customizing Codes

This function allows you to customize the EEPROM according to language, function settings, and firmware switch settings.

■ Operating Procedure

(1) For machines w/ fax: To make the equipment enter the maintenance mode, press the **Menu**, *, **2**, **8**, **6**, and **4** keys in this order.
|← Within 2 seconds →|

For machines w/o fax: To make the equipment enter the maintenance mode, press the **Menu**, **0**, **2**, **8**, **6**, and **4** keys in this order.
|← Within 2 seconds →|

The equipment beeps for approx. one second and displays "▮▮ MAINTENANCE ▮▮▮" on the LCD.

(2) Press the **7** and **4** keys in this order in the initial stage of the maintenance mode.

The current customizing code (e.g., 9001 in the case of MFC9700 USA version) appears.

(3) Enter the desired customizing code (e.g., 0002 in the case of MFC9800 Canadian version).

The newly entered code appears.

NOTE: *If a wrong 4-digit code is entered, the equipment will malfunction.*

(4) For machines w/ fax: Press the **FaxStart** key.
For machines w/o fax: Press the **Sort** key.

The equipment saves the setting and returns to the initial stage of the maintenance mode.

If you press the **Stop** key or no keys are pressed for one minute in the above procedure, the equipment stops the procedure and returns to the initial stage of the maintenance mode.

■ EEPROM Customizing Codes List

Versions	Models		
	DCP1400	MFC9700	MFC9800
U.S.A.	0001	9001	9001
CANADA	-	0002	0002

Versions	Models		
	MFC9760	MFC9860	MFC9880
GERMANY	0003	0003	0003
U.K.	0004	-	0004
FRANCE	0005	-	0005
AUSTRALIA	-	-	0006
NORWAY	-	-	0007
BELGIUM	0008	-	0008
NETHERLANDS	0009	-	0009
SWITZERLAND	0010	-	0010
IRELAND	-	-	0004
FINLAND	-	-	-
DENMARK	0013	-	0013
AUSTRIA	-	-	0003
SPAIN	-	-	0015
ITALY	0016	-	0016
CHINA	-	-	-
TAIWAN	-	-	-
SOUTH AFRICA	-	-	-
SWEDEN	-	-	0026
NEW ZEALAND	-	-	0027
ASIA (SINGAPORE)	-	-	0040
GENERIC	0050	-	0050

MFC9800/MFC9700/DCP1400
MFC9880/MFC9860/MFC9760

Appendix 2. Firmware Switches (WSW)

WSW No.	Function	Reference Page
WSW01	Dial pulse setting	2
WSW02	Tone signal setting	3
WSW03	PABX mode setting	4
WSW04	TRANSFER facility setting	6
WSW05	1st dial tone and busy tone detection	7
WSW06	**Pause** key setting and 2nd dial tone detection	9
WSW07	Dial tone setting 1	11
WSW08	Dial tone setting 2	12
WSW09	Protocol definition 1	13
WSW10	Protocol definition 2	14
WSW11	Busy tone setting	15
WSW12	Signal detection condition setting	16
WSW13	Modem setting	17
WSW14	AUTO ANS facility setting	18
WSW15	REDIAL facility setting	19
WSW16	Function setting 1	20
WSW17	Function setting 2	21
WSW18	Function setting 3	22
WSW19	Transmission speed setting	23
WSW20	Overseas communications mode setting	24
WSW21	TAD setting 1	25
WSW22	ECM setting	25
WSW23	Communications setting	26
WSW24	TAD setting 2	27
WSW25	TAD setting 3	27
WSW26	Function setting 4	28
WSW27	Function setting 5	29
WSW28	Function setting 6	30
WSW29	Function setting 7	31
WSW30	Function setting 8	31
WSW31	Function setting 9	32
WSW32	Function setting 10	33
WSW33	Function setting 11	34
WSW34	Function setting 12	35
WSW35	Function setting 13	35
WSW36	Function setting 14	36
WSW37	Function setting 15	37
WSW38	Function setting 16	38
WSW39	Function setting 17	39
WSW40	Function setting 18	40
WSW41	Function setting 19	42
WSW42	Function setting 20	43
WSW43	Function setting 21	44
WSW44	Speeding up scanning-1	45
WSW45	Speeding up scanning-2	46
WSW46	Monitor of power ON/OFF state and parallel port kept at high	47
WSW47	Delay of FAX line disconnection	48
WSW48	Not used.	48
WSW49	Not used.	48
WSW50	Not used.	48

WSW01 (Dial pulse setting)

Selector No.	Function	Setting and Specifications
1 2	Dial pulse generation mode	No. 1 2 0 0 : N 0 1 : N+1 1 0 : 10-N 1 1 : N
3 4	Break time length in pulse dialing	No. 3 4 0 0 : 60 ms 0 1 : 67 ms 1 0 : 40 ms (for 16 PPS) 1 1 : 64 ms (at 106-ms intervals)
5 6	Inter-digit pause	No. 5 6 0 0 : 800 ms 0 1 : 850 ms 1 0 : 950 ms 1 1 : 600 ms
7	Switching between pulse (DP) and tone (PB) dialing, by the function switch	0: Yes 1: No
8	Default dialing mode, pulse (DP) or tone (PB) dialing	0: PB 1: DP

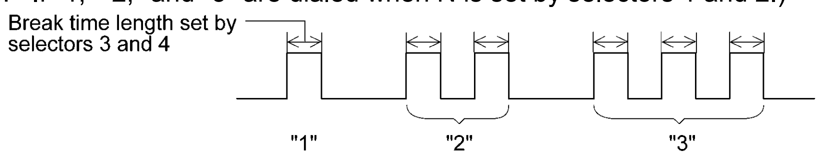
- **Selectors 1 and 2: Dial pulse generation mode**

  These selectors set the number of pulses to be generated in pulse dialing.

  N: Dialing "N" generates "N" pulses. (Dialing "0" generates 10 pulses.)
  N + 1: Dialing "N" generates "N + 1" pulses.
  10 - N: Dialing "N" generates "10 - N" pulses.

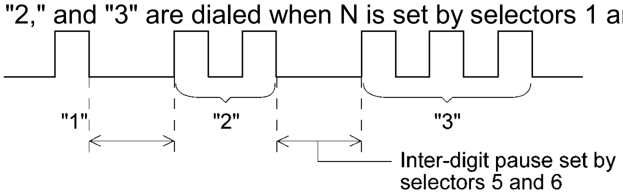
- **Selectors 3 and 4: Break time length in pulse dialing**

  These selectors set the break time length in pulse dialing.
  (Example: If "1," "2," and "3" are dialed when N is set by selectors 1 and 2.)



- **Selectors 5 and 6: Inter-digit pause**

  These selectors set the inter-digit pause in pulse dialing.
  (Example: If "1," "2," and "3" are dialed when N is set by selectors 1 and 2.)



- **Selector 7: Switching between pulse (DP) and tone (PB) dialing, by the function switch**

  This selector determines whether or not the dialing mode may be switched between the pulse (DP) and tone (PB) dialing by using the function switch.

- **Selector 8: Default dialing mode, pulse (DP) or tone (PB) dialing**

  This selector sets the default dialing mode (pulse dialing or tone dialing) which may be changed by the function switch. If the user switches it with the function switch when selector 7 is set to "0," the setting specified by this selector will also be switched automatically.

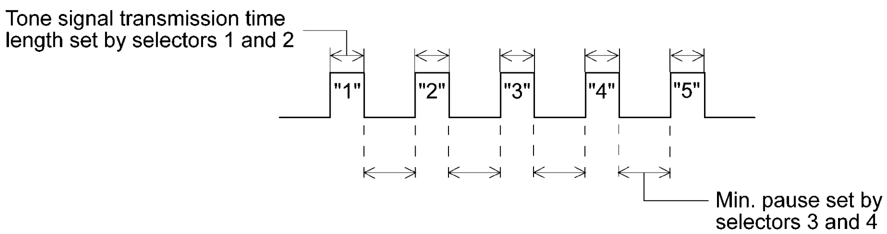
WSW02 (Tone signal setting)

Selector No.	Function	Setting and Specifications
1 2	Tone signal transmission time length	No. 1 2 0 0 : 70 ms 0 1 : 80 ms 1 0 : 90 ms 1 1 : 100 ms
3 4	Min. pause in tone dialing	No. 3 4 0 0 : 70 ms 0 1 : 80 ms 1 0 : 90 ms 1 1 : 140 ms
5 | 8	Attenuator for pseudo ring backtone to the line (selectable in the range of 0-15 dB)	0: 0 dB 1: 8 dB 0: 0 dB 1: 4 dB 0: 0 dB 1: 2 dB 0: 0 dB 1: 1 dB

- **Selectors 1 through 4: Tone signal transmission time length and Min. pause in tone dialing**

  These selectors set the tone signal transmission time length and minimum pause in tone dialing.

  (Example: If "1," "2," "3," "4," and "5" are dialed.)



- **Selectors 5 through 8: Attenuator for pseudo ring backtone to the line**

  These selectors are used to adjust the sound level of beep generated as a ring backtone in the F/T mode or as a signal during remote control operation or at the start of ICM recording.

  Setting two or more selectors to "1" produces addition of attenuation assigned to each selector.

WSW03 (PABX* mode setting)

Selector No.	Function	Setting and Specifications
1	CNG detection when sharing a modular wall socket with a telephone	0: A 1: B
2 | 4	Min. detection time length of PABX* dial tone, required for starting dialing	No. 2 3 4 0 0 0 : 50 ms 0 0 1 : 210 ms 0 1 0 : 500 ms 0 1 1 : 800 ms 1 0 0 : 900 ms 1 0 1 : 1.5 sec. 1 1 0 : 2.0 sec. 1 1 1 : 2.5 sec.
5	CNG detection when sharing a modular wall socket with a telephone	0: A 1: B
6 7	Dial tone detection in PABX*	No. 6 7 0 0 : No detection (3.5 sec. WAIT) 0 1 : No detection (5 sec. WAIT) 1 0 : No detection (7 sec. WAIT) 1 1 : Detection (Frequency only)
8	Not used.	

* PABX: Private automatic branch exchange

NOTE: Selectors 2 through 4, 6 and 7 are not applicable where no PABX is installed.

- **Selectors 1 and 5: CNG detection when sharing a modular wall socket with a telephone**

  These selectors determine whether or not the machine detects a CNG signal when a line is connected to a telephone sharing a modular wall socket with the machine. Upon detection of CNG signals by the number of cycles specified by these selectors, the machine interprets CNG as an effective signal and then starts FAX reception.

Selector No. 1	Selector No. 5	Cycle
0 (A)	0 (A)	0.5 cycle
0 (A)	1 (B)	1.0 cycle
1 (B)	0 (A)	1.5 cycles
1 (B)	1 (B)	2.0 cycles

- **Selectors 2 through 4: Min. detection time length of PABX dial tone, required for starting dialing**

  Upon detection of the PABX dial tone for the time length set by these selectors, the machine starts dialing.

  These selectors are effective only when both selectors 6 and 7 are set to "1" (Detection).

- **Selectors 6 and 7: Dial tone detection in PABX**

  These selectors activate or deactivate the dial tone detection function which detects a dial tone when a line is connected to the PABX.

  Setting both of these selectors to "1" activates the dial tone detection function so that the machine starts dialing upon detection of a dial tone when a line is connected.

  Other setting combinations deactivate the dial tone detection function so that the machine starts dialing after the specified WAIT (3.5, 5.0, or 7.0 sec.) without detection of a dial tone when a line is connected.

WSW04 (TRANSFER facility setting)

Selector No.	Function	Setting and Specifications
1	Earth function in transfer facility	0: Provided 1: Not provided
2 | 4	Not used.	
5 6	Earth time length for earth function	No. 5 6 0 0 : 200 ms 0 1 : 300 ms 1 0 : 500 ms 1 1 : 700 ms
7 8	Break time length for flash function	No. 7 8 0 0 : 80 ms 0 1 : 110 ms 1 0 : 250 ms 1 1 : 500 ms

NOTE: Selectors 5 through 8 are not applicable in those countries where no transfer facility is supported.

- **Selector 1: Earth function in transfer facility**

  This selector determines whether or not the earth function is added to the transfer setting menu to be accessed by the function switch.

- **Selectors 5 and 6: Earth time length for earth function**

  These selectors set the short-circuiting time length of the telephone line (La or Lb) to ground.

  This setting is effective only when the earth function is selected for the R key by using the function switch.

- **Selectors 7 and 8: Break time length for flash function**

  These selectors set the break time length.

  This setting is effective only when the flash function is selected for the R key by using the function switch.

WSW05 (1st dial tone and busy tone detection)

Selector No.	Function	Setting and Specifications
1 | 3	1st dial tone detection	No. 1 2 3 0 0 0 : 3.5 sec. WAIT 0 0 1 : 7.0 sec. WAIT 0 1 0 : 10.5 sec. WAIT 0 1 1 : 14.0 sec. WAIT 1 0 0 : 17.5 sec. WAIT 1 0 1 : 21.0 sec. WAIT 1 1 0 : 24.5 sec. WAIT 1 1 1 : Detection (Without WAIT)
4	Max. pause time allowable for remote ID code detection	0 : 2 seconds 1: 1 second
5 6	Busy tone detection in automatic sending mode	No. 5 6 0 0 : No detection 0 1 : Detection only after dialing 1 0 : No detection 1 1 : Detection before and after dialing
7	Busy tone detection in automatic receiving mode	0 : Yes 1: No
8	DTMF detection period	0 : 40 ms min. 1: 100 ms min.

NOTE: Selectors 5 through 7 are not applicable in those countries where no busy tone detection is supported.

- **Selectors 1 through 3: 1st dial tone detection**

  These selectors activate or deactivate the 1st dial tone detection function which detects the 1st dial tone issued from the PSTN when a line is connected to the PSTN.

  Setting all of these selectors to "1" activates the dial tone detection function so that the machine starts dialing upon detection of a dial tone when a line is connected. For the detecting conditions of the 1st dial tone, refer to WSW07 and WSW08.

  Other setting combinations deactivate the dial tone detection function so that the machine starts dialing after the specified WAIT (3.5, 7.0, 10.5, 14.0, 17.5, 21.0, or 24.5 seconds) without detection of a dial tone when a line is connected to the PSTN.

- **Selector 4: Max. pause time allowable for remote ID code detection**

  This selector sets the maximum pause time allowable for detecting the second digit of a remote ID code after detection of the first digit in remote reception.

  If selector 4 is set to "0" (2 seconds), for instance, only a remote ID code whose second digit is detected within 2 seconds after detection of the first digit will become effective so as to activate the remote function.

- **Selectors 5 and 6: Busy tone detection in automatic sending mode**

  These selectors determine whether or not the machine automatically disconnects a line upon detection of a busy tone in automatic sending mode.

  Setting selector 6 to "0" ignores a busy tone so that the machine does not disconnect the line.

  Setting selectors 5 and 6 to "0" and "1," respectively, makes the machine detect a busy tone only after dialing and disconnect the line.

  Setting both of selectors 5 and 6 to "1" makes the machine detect a busy tone before and after dialing and then disconnect the line.

- **Selector 7: Busy tone detection in automatic receiving mode**

  This selector determines whether or not the machine automatically disconnects a line upon detection of a busy tone in automatic receiving mode.

WSW06 (Pause key setting and 2nd dial tone detection)

Selector No.	Function	Setting and Specifications
1 | 3	**Pause** key setting and 2nd dial tone detection	No. 1 2 3 0 0 0 : No pause 0 0 1 : 3.5 sec. WAIT 0 1 0 : 7 sec. WAIT 0 1 1 : 10.5 sec. WAIT 1 0 0 : 14 sec. WAIT 1 1 0 : 2nd dial tone detection only in pulse dialing (DP) system 1 0 1 : 1 1 1 : } 2nd dial tone detection both in DP and push-button (PB) dialing system
4 | 6	Detection of 2nd dial tone	No. 4 5 6 0 0 0 : 50 ms 0 0 1 : 210 ms 0 1 0 : 500 ms 0 1 1 : 800 ms 1 0 0 : 900 ms 1 0 1 : 1.5 sec. 1 1 0 : 2.0 sec. 1 1 1 : 2.5 sec.
7	No. of 2nd dial tone detection times	0: Once 1: Twice
8	2nd dial tone interrupt detecting time	0: 30 ms 1: 50 ms

- **Selectors 1 through 3: Pause key setting and 2nd dial tone detection**

Selectors 1 2 3	
0 0 0	No WAIT is inserted even if the **Pause** key is pressed.
0 0 1 0 1 0 0 1 1 1 0 0	If you press the **Pause** key during dialing, the machine will insert WAIT as defined in the above table. If the **Pause** key is pressed repeatedly, the machine inserts the specified WAIT multiplied by the number of depressions. It applies also in hook-up dialing.
1 0 1 1 1 0 1 1 1	When these selectors are set to "1, 0, 1": If you press the **Pause** key during dialing, the machine will wait for the 2nd dial tone to be sent via the communications line. When these selectors are set to "1, 1, 0" or "1, 1, 1": If you press the **Pause** key during dialing, the machine will first wait for the 2nd dial tone to be sent via the communications line. After that, the machine will insert a WAIT of 3.5 seconds. If no 2nd dial tone is received within the specified time length (set by WSW08), the machine will disconnect the line if in automatic dialing, or it will start transmitting the dial signal if given after depression of the **Pause** key in hook-up dialing.

- **Selectors 4 through 6: Detection of 2nd dial tone**

  Upon detection of the 2nd dial tone for the time length specified by these selectors, the machine starts dialing.

  This setting is effective only when the 2nd dial tone detection function is activated by selectors 1 through 3 (Setting 101, 110, or 111).

  This function does not apply in those countries where no dial tone detection function is supported.

- **Selector 7: No. of 2nd dial tone detection times**

  This selector sets the number of dial tone detection times required for starting dialing.

- **Selector 8: 2nd dial tone interrupt detecting time**

  This selector sets the allowable time length of an interrupt which should not be interpreted as an interrupt in the 2nd tone dialing.

WSW07 (Dial tone setting 1)

Selector No.	Function	Setting and Specifications
1 2	Frequency band range	No. 1 2 0 0 : Narrows by 10 Hz 0 1 : Initial value 1 X : Widens by 10 Hz
3	Line current detection	0: No 1: Yes
4 | 6	2nd dial tone detection level (Z = 600 Ω)	No. 4 5 6 0 0 0 : -21 dBm 0 0 1 : -24 dBm 0 1 0 : -27 dBm 0 1 1 : -30 dBm 1 0 0 : -33 dBm 1 0 1 : -36 dBm 1 1 0 : -39 dBm 1 1 1 : -42 dBm
7	1st dial tone interrupt detecting time	0: 30 ms 1: 50 ms
8	Not used.	

NOTE: Selectors 1 through 7 are not applicable in those countries where no dial tone or line current detection is supported, e.g., U.S.A.

- **Selectors 1 and 2: Frequency band range**

  These selectors set the frequency band for the 1st dial tone and the busy tone (before dialing) to be detected.

  This setting is effective only when selectors 1 through 3 of WSW05 are set to "1,1,1."

- **Selector 3: Line current detection**

  This selector determines whether or not the machine should detect a line current before starting dialing.

- **Selectors 4 through 6: 2nd dial tone detection level**

  These selectors set the detection level of the 2nd dial tone.

- **Selector 7: 1st dial tone interrupt detecting time**

  This selector sets the allowable time length of an interrupt which should not be interpreted as an interrupt in the 1st dial tone dialing.

WSW08 (Dial tone setting 2)

Selector No.	Function	Setting and Specifications
1 | 3	1st dial tone detection time length	No. 1 2 3 0 0 0 : 50 ms 0 0 1 : 210 ms 0 1 0 : 500 ms 0 1 1 : 800 ms 1 0 0 : 900 ms 1 0 1 : 1.5 sec. 1 1 0 : 2.0 sec. 1 1 1 : 2.5 sec.
4 5	Time-out length for 1st and 2nd dial tone detection	No. 4 5 0 0 : 10 sec. 0 1 : 20 sec. 1 0 : 15 sec. 1 1 : 30 sec.
6 | 8	Detection level of 1st dial tone and busy tone before dialing	No. 6 7 8 0 0 0 : -21 dBm 0 0 1 : -24 dBm 0 1 0 : -27 dBm 0 1 1 : -30 dBm 1 0 0 : -33 dBm 1 0 1 : -36 dBm 1 1 0 : -39 dBm 1 1 1 : -42 dBm

NOTE: The WSW08 is not applicable in those countries where no dial tone detection is supported, e.g., U.S.A.

- **Selectors 1 through 3: 1st dial tone detection time length**

  Upon detection of the 1st dial tone for the time length set by these selectors, the machine starts dialing.

  This setting is effective only when selectors 1 through 3 of WSW05 are set to "1,1,1."

- **Selectors 4 and 5: Time-out length for 1st and 2nd dial tone detection**

  These selectors set the time-out length for the 1st and 2nd dial tone detection so that the machine waits dial tone input for the specified time length and disconnects itself from the line when no dial tone is inputted.

WSW09 (Protocol definition 1)

Selector No.	Function	Setting and Specifications
1	Frame length selection	0: 256 octets 1: 64 octets
2	Use of non-standard commands	0: Allowed 1: Prohibited
3 4	No. of retries	No. 3 4 0 0 : 4 times 0 1 : 3 times 1 0 : 2 times 1 1 : 1 time
5	T5 timer	0: 300 sec. 1: 60 sec.
6	T1 timer	0: 35 sec. 1: 40 sec.
7 8	Elapsed time for time-out control for no response from the called station in automatic sending mode	No. 7 8 0 0 : 60 sec. (55 sec. for US and Canada) 0 1 : 140 sec. 1 0 : 90 sec. 1 1 : 35 sec.

NOTE: Selectors 1 through 6 are not applicable in those models which do not support ECM.

- **Selector 1: Frame length selection**

  Usually a single frame consists of 256 octets (1 octet = 8 bits). For communications lines with higher bit error rate, however, set selector 1 to "1" so that the machine can divide a message into 64-octet frames.

  Remarks: The error correction mode (ECM) is a facsimile transmission manner in which the machine divides a message into frames for transmission so that if any data error occurs on the transmission line, the machine retransmits only those frames containing the error data.

- **Selector 2: Use of non-standard commands**

  If this selector is set to "0," the machine may use non-standard commands (the machine's native-mode commands, e.g., NSF, NSC, and NSS) for communications. If it is set to "1," the machine will use standard commands only.

- **Selectors 3 and 4: No. of retries**

  These selectors set the number of retries in each specified modem transmission speed.

- **Selector 5: T5 timer**

  This selector sets the time length for the T5 timer.

- **Selector 6: T1 timer**

  This selector sets the time length for the T1 timer.

- **Selectors 7 and 8: Elapsed time for time-out control**

  If the machine receives no response (no G3 command) from the called terminal in automatic sending during the time set by these selectors, it disconnects the line.

WSW10 (Protocol definition 2)

Selector No.	Function		Setting and Specifications
1	Switching of DPS, following the CML ON/OFF		0: No 1: Yes
2	Time length from transmission of the last dial digit to CML ON		0: 100 ms 1: 50 ms
3	Time length from CML ON to CNG transmission		0: 2 sec. 1: 4 sec.
4	Time length from CML ON to CED transmission (except for facsimile-to-telephone switching)		0: 0.5 sec. 1: 2 sec.
5 6	No. of training retries		No. 5 6 0 0 : 1 time 0 1 : 2 times 1 0 : 3 times 1 1 : 4 times
7	Encoding system (Compression)	MR	0: Allowed 1: Not allowed
8		MMR	0: Allowed 1: Not allowed

- **Selector 1: Switching of DPS, following the CML ON/OFF**

  Setting this selector to "1" automatically switches DPS following the CML ON/OFF operation.

- **Selector 2: Time length from transmission of the last dial digit to CML ON**

  This selector sets the time length from when the machine transmits the last dial digit until the CML relay comes on.

- **Selector 3: Time length from CML ON to CNG transmission**

  This selector sets the time length until the machine transmits a CNG after it turns on the CML relay.

- **Selector 4: Time length from CML ON to CED transmission**

  This selector sets the time length until the machine transmits a CED after it turns on the CML relay. This setting does not apply to switching between facsimile and telephone.

- **Selectors 5 and 6: No. of training retries**

  These selectors set the number of training retries to be repeated before automatic fallback.

- **Selectors 7 and 8: Encoding system (Compression)**

  This selector determines whether or not use of the MR/MMR coding system will be allowed.

WSW11 (Busy tone setting)

Selector No.	Function	Setting and Specifications
1 2	Frequency band range	No. 1 2 0 0 : Narrows by 10 Hz 0 1 : Initial value 1 x : Widens by 10 Hz
3	Not used.	
4	ON/OFF time length ranges (More than one setting allowed)	1: 400-600/400-600 ms
5		1: 175-440/175-440 ms
6		1: 100-1000/17-660 ms
7		1: 110-410/320-550 ms
8		1: 100-660/100-660 ms

NOTE: WSW11 is not applicable in those countries where no busy tone detection is supported.

NOTE: The setting of WSW11 is effective only when selectors 5 and 6 of WSW05 are set to "0, 1" or "1, 1" (Busy tone detection).

- **Selectors 1 and 2: Frequency band range**

  These selectors set the frequency band for busy tone to be detected.

- **Selectors 4 through 8: ON/OFF time length ranges**

  These selectors set the ON and OFF time length ranges for busy tone to be detected. If more than one selector is set to "1," the ranges become wider. For example, if selectors 4 and 5 are set to "1," the ON and OFF time length ranges are from 175 to 600 ms.

WSW12 (Signal detection condition setting)

Selector No.	Function	Setting and Specifications
1 2	Min. OFF time length of calling signal (Ci)	No. 1 2 0 0 : 1500 ms 0 1 : 500 ms 1 0 : 700 ms 1 1 : 900 ms
3 4	Max. OFF time length of calling signal (Ci)	No. 3 4 0 0 : 6 sec. 0 1 : 7 sec. 1 0 : 9 sec. 1 1 : 11 sec.
5 6	Detecting time setting	No. 5 6 0 0 : 800 ms 0 1 : 200 ms 1 0 : 250 ms 1 1 : 150 ms
7	Delay	0: Yes 1: No
8	Not used.	

- **Selectors 1 through 4: Min. and max. OFF time length of calling signal (Ci)**

  If the machine detects the OFF state of calling signal (Ci) for a time length which is greater than the value set by selectors 1 and 2 and less than the value set by selectors 3 and 4, it interprets the Ci signal as OFF.

- **Selectors 5 and 6: Detecting time setting**

  These selectors set the time length required to make the machine acknowledge itself to be called. That is, if the machine continuously detects calling signals with the frequency set by selectors 1 through 4 of WSW14 during the time length set by these selectors 5 and 6, it acknowledges the call.

- **Selector 7: Delay**

  Setting this selector to "0" allows the equipment to insert a 900 ms WAIT after acknowledgment of the call until the equipment turns on the CML relay to start receiving operation.

WSW13 (Modem setting)

Selector No.	Function	Setting and Specifications
1 2	Cable equalizer	No. 1 2 0 0 : 0 km 0 1 : 1.8 km 1 0 : 3.6 km 1 1 : 5.6 km
3 4	Reception level	No. 3 4 0 0 : -43 dBm 0 1 : -47 dBm 1 0 : -49 dBm 1 1 : -51 dBm
5 | 8	Modem attenuator	0: 0 dB 1: 8 dB 0: 0 dB 1: 4 dB 0: 0 dB 1: 2 dB 0: 0 dB 1: 1 dB

The modem should be adjusted according to the user's line conditions.

- **Selectors 1 and 2: Cable equalizer**

  These selectors are used to improve the pass-band characteristics of analogue signals on a line. (Attenuation in the high-band frequency is greater than in the low-band frequency.)

  Set these selectors according to the distance from the telephone switchboard to the machine.

- **Selectors 3 and 4: Reception level**

  These selectors set the optimum receive signal level.

- **Selectors 5 through 8: Modem attenuator**

  These selectors are used to adjust the transmitting level of the modem when the reception level at the remote station is improper due to line loss. This function applies to G3 protocol signals.

  Setting two or more selectors to "1" produces addition of attenuation assigned to each selector.

  This setting will be limited if selector 8 of WSW23 is set to "0."

WSW14 (AUTO ANS facility setting)

Selector No.	Function	Setting and Specifications
1 2	Frequency band selection (Lower limit)	No. 1 2 0 0 : 13 Hz 0 1 : 15 Hz 1 0 : 23 Hz 1 1 : 20 Hz
3 4	Frequency band selection (Upper limit)	No. 3 4 0 0 : 30 Hz 0 1 : 55 Hz 1 0 : 70 Hz 1 1 : 200 Hz
5 | 8	No. of rings in AUTO ANS mode	No. 5 6 7 8 0 0 0 0 : Fixed to once 0 0 0 1 : Fixed to 2 times 0 0 1 0 : Fixed to 3 times 0 0 1 1 : Fixed to 4 times 0 1 0 0 : 1 to 2 times 0 1 0 1 : 1 to 3 times 0 1 1 0 : 1 to 4 times 0 1 1 1 : 1 to 5 times 1 0 0 0 : 2 to 3 times 1 0 0 1 : 2 to 4 times 1 0 1 0 : 2 to 5 times 1 0 1 1 : 2 to 6 times 1 1 0 0 : 1 to 10 times 1 1 0 1 : 2 to 10 times 1 1 1 0 : 3 to 5 times 1 1 1 1 : 4 to 10 times

- **Selectors 1 through 4: Frequency band selection**

  These selectors are used to select the frequency band of calling signals for activating the AUTO ANS facility.

  In the French versions, if the user sets the PBX to OFF from the control panel, the setting made by selectors 1 and 2 will take no effect and the frequency's lower limit will be fixed to 32 Hz. (Even if the setting made by these selectors does not apply, it will be printed on the configuration list.)

- **Selectors 5 through 8: No. of rings in AUTO ANS mode**

  These selectors set the number of rings to initiate the AUTO ANS facility.

WSW15 (REDIAL facility setting)

Selector No.	Function	Setting and Specifications
1 2	Selection of redial interval	No. 1 2 0 0 : 5 minutes 0 1 : 1 minute 1 0 : 2 minutes 1 1 : 3 minutes
3 | 6	No. of redialings	No. 3 4 5 6 0 0 0 0 : 16 times 0 0 0 1 : 1 times 0 0 1 0 : 2 times 0 0 1 1 : 3 times | | 1 1 1 1 : 15 times
7	Redialing for no response sent from the called terminal	0: Redialing 1: No redialing
8	Not used.	

NOTE: Selector 7 is not applicable in those countries where no busy tone detection is supported.

- **Selectors 1 through 6: Selection of redial interval and No. of redialings**

  The machine redials by the number of times set by selectors 3 through 6 at intervals set by selectors 1 and 2.

  This setting is effective only when selector 7 is set to "0."

- **Selectors 7: Redialing for no response sent from the called terminal**

  This selector determines whether or not the machine redials if no G3 command response comes from the called station after dialing within the time length set by selectors 7 and 8 of WSW09.

WSW16 (Function setting 1)

Selector No.	Function	Setting and Specifications
1	Not used.	
2	CCITT superfine recommendation	0: OFF 1: ON
3 | 6	Not used.	
⑦	Max. document length limitation	0: 400 cm 1: 90 cm
8	**Stop** key pressed during reception	0: Not functional 1: Functional

- **Selector 2: CCITT superfine recommendation**

  If this selector is set to "1," the machine communicates in CCITT recommended superfine mode (15.4 lines/mm). If it is set to "0," it communicates in native superfine mode.

- **Selector 7: Max. document length limitation**

  This selector is used to select the maximum length of a document to be sent.

- **Selector 8: Stop key pressed during reception**

  If this selector is set to "1," pressing the **Stop** key can stop the current receiving operation. The received data will be lost.

WSW17 (Function setting 2)

Selector No.	Function	Setting and Specifications
1 2	Off-hook alarm	No. 1 2 0 0 : No alarm 0 1 : Always valid 1 X : Valid except when 'call reservation' is selected.
3 4	Not used.	
⑤	Calendar clock type	0: U.S.A. type 1: European type
6	Not used.	
7	Non-ring reception	0: OFF 1: ON
8	Not used.	

- **Selectors 1 and 2: Off-hook alarm**

  These selectors activate or deactivate the alarm function which sounds an alarm when the handset is off the hook after the communication is completed.

  The off-hook alarm works also for an external telephone connected to the EXT modular socket.

- **Selector 5: Calendar clock type**

  If this selector is set to "0" (USA), the MM/DD/YY hh:mm format applies; if it is set to "1" (Europe), the DD/MM/YY hh:mm format applies: DD is the day, MM is the month, YY is the last two digits of the year, hh is the hour, and mm is the minute.

- **Selector 7: Non-ring reception**

  Setting this selector to "1" makes the machine receive calls without ringer sound if the ring delay is set to 0.

WSW18 (Function setting 3)

Selector No.	Function	Setting and Specifications
1	Not used.	
2 3	Detection enabled time for CNG and no tone	No. 2 3 0 0 : 40 sec. 0 1 : 0 sec. (No detection) 1 0 : 5 sec. 1 1 : 80 sec.
4 5	Not used.	
6	Registration of station ID	0: Permitted 1: Prohibited
7 8	Tone sound monitoring	No. 7 8 0 X : No monitoring 1 0 : Up to phase B at the calling station only 1 1 : All transmission phases both at the calling and called stations

- **Selectors 2 and 3: Detection enabled time for CNG and no tone**

  After the line is connected via the machine or the external telephone, the machine can detect a CNG signal or no tone for the time length specified by these selectors. The setting specified by these selectors becomes effective only when selector 8 of WSW20 is set to "1."

- **Selectors 7 and 8: Tone sound monitoring**

  These selectors set monitoring specifications of the tone sound inputted from the line.

WSW19 (Transmission speed setting)

Selector No.	Function	Setting and Specifications
1 | 3	First transmission speed choice for fallback	No. 1 2 3 No. 4 5 6 0 0 0 : 2,400 bps 0 0 1 : 4,800 bps 0 1 0 : 7,200 bps 0 1 1 : 9,600 bps 1 0 0 : 12,000 bps 1 0 1 : 1 1 0 : 14,400 bps 1 1 1 :
4 | 6	Last transmission speed choice for fallback	
7	V. 34 mode	0: Permitted 1: Prohibited
8	V. 17 mode	0: Permitted 1: Prohibited

NOTE: For the transmission speed setting in V.34 mode, refer to WSW39.

- **Selectors 1 through 6: First and last choices of transmission speed for fallback**

  These selectors are used to set the modem speed range. With the first transmission speed choice specified by selectors 1 through 3, the machine attempts to establish the transmission link via the modem. If the establishment fails, the machine automatically steps down to the next highest speed and attempts to establish the transmission link again. The machine repeats this sequence while stepping down the transmission speed to the last choice specified by selectors 4 through 6.

  If the modem always falls back to a low transmission speed (e.g., 4,800 bps), set the first transmission speed choice to the lower one (e.g., modify it from 12,000 bps to 7,200 bps) in order to deactivate the high-speed modem function and reduce the training time for shorter transmission time.

  Generally, to save the transmission time, set the last transmission speed choice to a higher one.

- **Selector 7: V. 34 mode**

  This selector determines whether or not the machine communicates with the remote station in the V. 34 mode when that station supports the V. 34 mode.

WSW20 (Overseas communications mode setting)

Selector No.	Function	Setting and Specifications
1	EP* tone prefix	0: OFF 1: ON
2	Overseas communications mode (Reception)	0: 2100 Hz 1: 1100 Hz
3	Overseas communications mode (Transmission)	0: OFF 1: Ignores DIS once.
4 5	Min. time length from reception of CFR to start of transmission of video signals	No. 4 5 0 0 : 100 ms 0 1 : 200 ms 1 0 : 300 ms 1 1 : 400 ms
6 7	Chattering noise elimination at detection of CNG	No. 6 7 0 0 : Yes (When CNG goes either ON or OFF) 0 1 : Yes (Only when CNG goes OFF) 1 0 : No 1 1 : No
8	CNG detection on/off	0: OFF 1: ON

* EP: Echo protection

- **Selector 1: EP tone prefix**

  Setting this selector to "1" makes the machine transmit a 1700 Hz echo protection (EP) tone immediately preceding training in V.29 modulation system to prevent omission of training signals.

  Prefixing an EP tone is effective when the machine fails to transmit at the V.29 modem speed and always has to fall back to 4800 bps transmission.

- **Selectors 2 and 3: Overseas communications mode**

  These selectors should be used if the machine malfunctions in overseas communications. According to the communications error state, select the signal specifications.

  Setting selector 2 to "1" allows the machine to use 1100 Hz CED signal instead of 2100 Hz in receiving operation. This prevents malfunctions resulting from echoes, since the 1100 Hz signal does not disable the echo suppressor (ES) while the 2100 Hz signal does.

  Setting selector 3 to "1" allows the machine to ignore a DIS signal sent from the called station once in sending operation. This operation suppresses echoes since the first DIS signal immediately follows a 2100 Hz CED (which disables the ES) so that it is likely to be affected by echoes in the disabled ES state. However, such a disabled ES state will be removed soon so that the second and the following DIS signals are not susceptible to data distortion due to echoes. Note that some models when called may cause error by receiving a self-outputted DIS.

- **Selectors 8: CNG detection on/off**

  If this selector is set to "1," the machine detects a CNG signal according to the condition preset by selectors 2 and 3 of WSW18 after a line is connected. If it is set to "0," the machine detects a CNG signal as long as the line is connected.

WSW21 (TAD setting 1)

Selector No.	Function	Setting and Specifications
1 | 7	Not used.	
8	Erasure of message stored in the memory after the message transfer	0: Yes 1: No

- **Selector 8: Erasure of message**

  Setting this selector to "0" will erase the message recorded in the memory after the document retrieval feature transfers the message.

WSW22 (ECM setting)

Selector No.	Function	Setting and Specifications
1	ECM* in sending	0: ON 1: OFF
2	ECM* in receiving	0: ON 1: OFF
3	Call Waiting Caller ID	0: ON 1: OFF
4	Not used.	
5 | 8	Acceptable TCF bit error rate (%) (Only at 4800 bps)	0: 0% 1: 8% 0: 0% 1: 4% 0: 0% 1: 2% 0: 0% 1: 1%

* ECM: Error correction mode

NOTE: Selector 3 is applicable to the American version only, but not applicable to those models equipped with high-speed modem.

NOTE: Selectors 5 through 8 are applicable to the Asian version only.

- **Selector 3: Call Waiting Caller ID**

  Setting this selector to "0" allows the user to decide whether or not to interrupt the current call when a new call comes in. If Call Waiting Caller ID service is available in the area and the user subscribes to it, he/she can see information about his/her incoming call.

- **Selectors 5 through 8: Acceptable TCF bit error rate (%)**

  Setting two or more selectors to "1" produces addition of percent assigned to each selector. If you set selectors 7 and 8 to "1," the acceptable TCF bit error rate will be 3%.

WSW23 (Communications setting)

Selector No.	Function	Setting and Specifications
1	Starting point of training check (TCF)	0: From the head of a series of zeros 1: From any arbitrary point
2 3	Allowable training error rate	No. 2 3 0 0 : 0% 0 1 : 0.5% 1 0 : 1% 1 1 : 2%
4 5	Decoding error rate for transmission of RTN	No. 4 5 0 0 : 16% 0 1 : 14% 1 0 : 10% 1 1 : 8%
6 7	Not used.	
8	Limitation of attenuation level	0: Yes 1: No

NOTE: Selector 8 is not applicable to the French versions.

- **Selector 1: Starting point of training check (TCF)**

  At the training phase of receiving operation, the called station detects for 1.0 second a training check (TCF) command, a series of zeros which is sent from the calling station for 1.5 seconds to verify training and give the first indication of the acceptability of the line.

  This selector sets the starting point from which the called station should start counting those zeros. If this selector is set to "0," the called station starts counting zeros 100 ms after the head of a series of zeros is detected.

  If it is set to "1," the called station starts counting zeros upon detection of 10-ms successive zeros 50 ms after the head of a series of zeros is detected. In this case, if the detection of 10-ms successive zeros is too late, the data counting period will become less than 1.0 second, making the called station judge the line condition unacceptable.

- **Selectors 2 and 3: Allowable training error rate**

  The called station checks a series of zeros gathered in training (as described in Selector 1) according to the allowable training error rate set by these selectors. If the called station judges the line condition to be accepted, it responds with CFR; if not, it responds with FTT.

- **Selectors 4 and 5: Decoding error rate for transmission of RTN**

  The machine checks the actual decoding errors and then transmits an RTN according to the decoding error rate (Number of lines containing an error per page ÷ Total number of lines per page) set by these selectors.

- **Selector 8: Limitation of attenuation level**

  Setting this selector to "0" limits the transmitting level of the modem to 10 dB.

  This setting has priority over the settings selected by WSW02 (selectors 5 through 8) and WSW13 (selectors 5 through 8).

WSW24 (TAD setting 2)

Selector No.	Function	Setting and Specifications
1 2	Not used.	
3 4	Time length from CML ON to start of pseudo ring backtone transmission	No. 3 4 0 0 : 4 sec. 0 1 : 3 sec. 1 0 : 2 sec. 1 1 : 1 sec.
5 | 8	Not used.	

- **Selectors 3 and 4: Time length from CML ON to start of pseudo ring backtone transmission**

  These selectors set the length of time from CML-ON up to the start of pseudo ring backtone transmission.

WSW25 (TAD setting 3)

Selector No.	Function	Setting and Specifications
1 | 4	Not used.	
5 | 7	Pause between paging number and PIN	No. 5 6 7 0 0 0 : 2 sec. 0 0 1 : 4 sec. 0 1 0 : 6 sec. 0 1 1 : 8 sec. 1 0 0 : 10 sec. 1 0 1 : 12 sec. 1 1 0 : 14 sec. 1 1 1 : 16 sec.
8	Not used.	

- **Selectors 5 through 7: Pause between paging number and PIN**

  These selectors set the pause time between a telephone number being paged and PIN (private identification number) for the paging feature.

WSW26 (Function setting 4)

Selector No.	Function	Setting and Specifications
1 2	Not used.	
3	Dialing during document reading into the temporary memory in in-memory message transmission	0: Disabled 1: Enabled
4 5	No. of CNG cycles to be detected (when the line is connected via the external telephone except in the external TAD mode)	No. 4 5 0 0 : 0.5 (A) 0 1 : 1 (B) 1 0 : 1.5 (C) 1 1 : 2 (D)
6 7	No. of CNG cycles to be detected (when the line is connected via the external telephone in the external TAD mode)	No. 4 5 0 0 : 0.5 (A) 0 1 : 1 (B) 1 0 : 1.5 (C) 1 1 : 2 (D)
8	Not used.	

NOTE: Selectors 6 and 7 take effect only in the V.34 mode.

- **Selector 3: Dialing during document reading into the temporary memory in in-memory message transmission**

  If this selector is set to "0," the machine waits for document reading into the memory to complete and then starts dialing. This enables the machine to list the total number of pages in the header of the facsimile message.

- **Selectors 4 and 5: No. of CNG cycles to be detected (when the line is connected via the external telephone except in the external TAD mode)**

  The machine interprets a CNG as an effective signal if it detects a CNG signal by the number of cycles specified by these selectors when the line is connected via the external telephone except in the external TAD mode.

- **Selectors 6 and 7: No. of CNG cycles to be detected (when the line is connected via the external telephone in the external TAD mode)**

  The machine interprets a CNG as an effective signal if it detects a CNG signal by the number of cycles specified by these selectors when the line is connected via the external telephone in the external TAD mode.

WSW27 (Function setting 5)

Selector No.	Function	Setting and Specifications
1	Definition of programmable key	0: TEL key 1: TEL/POLLING key
2	Ringer OFF setting	0: Yes 1: No
3	Not used.	
4	Detection of distinctive ringing pattern	0: No 1: Yes
5 | 7	Not used.	
⑧	Toner save mode	0: Yes 1: No

NOTE: Selector 1 takes effect only in models/versions having a TEL key.

NOTE: Selector 4 is applicable only to the U.S.A. versions.

- **Selector 1: Definition of programmable key**

  This selector defines a programmable key as a TEL key or TEL/POLLING key.

  Setting this selector to "1" allows the programmable key to function as either a TEL or POLLING key if pressed when the handset is off or on the hook, respectively.

- **Selector 2: Ringer OFF setting**

  This selector determines whether or not the ringer can be set to OFF.

- **Selector 4: Detection of distinctive ringing pattern**

  If this selector is set to "1," the machine detects only the number of rings; if it is set to "0," the machine detects the number of rings and the ringing time length to compare the detected ringing pattern with the registered distinctive one.

WSW28 (Function setting 6)

Selector No.	Function	Setting and Specifications
1 | 3	Transmission level of DTMF high-band frequency signal	No. 1 2 3 0 0 0 : 0 dB 0 0 1 : +1 dB 0 1 0 : +2 dB 0 1 1 : +3 dB 1 0 0 : 0 dB 1 0 1 : -1 dB 1 1 0 : -2 dB 1 1 1 : -3 dB
4 | 6	Transmission level of DTMF low-band frequency signal	No. 4 5 6 0 0 0 : 0 dB 0 0 1 : +1 dB 0 1 0 : +2 dB 0 1 1 : +3 dB 1 0 0 : 0 dB 1 0 1 : -1 dB 1 1 0 : -2 dB 1 1 1 : -3 dB
7 8	Not used.	

- **Selectors 1 through 6: Transmission level of DTMF high-/low-band frequency signal**

  These selectors are intended for the manufacturer who tests the machine for the Standard. Never access them.

WSW29 (Function setting 7)

Selector No.	Function	Setting and Specifications
1 | 6	Not used.	
7	Impedance switching control in pulse dialing	0: OFF 1: ON
8	Beep when the memory area for the activity report becomes full	0: No 1: Yes

NOTE: Selectors 7 and 8 are applicable to the European version only.

- **Selector 8: Beep when the memory area for the activity report becomes full**

  If this selector is set to "1," the machine will beep when the memory area for the activity report becomes full (as well as displaying a message on the LCD, prompting the output of the activity report).

WSW30 (Function setting 8)

Selector No.	Function	Setting and Specifications
1 | 3	Not used.	
④	Duty cycle control of pulsed current for the heat-fixing unit	0: OFF 1: ON
⑤	Drum cleaning prompt settings	0: ON 1: OFF
6 | 8	Not used.	

NOTE: Selector 4 is applicable to the European version only.

- **Selector 4: Duty cycle control of pulsed current for the heat-fixing unit**

  Setting this selector to "1" activates the duty cycle control that suppresses the rush current. The duty cycle is 10-ms ON and 20-ms OFF.

  However, the duty cycle control may emit switching noise to the AC line. Depending upon the codes and regulations in the country, this selector should be set to "0."

- **Selector 5: Drum cleaning prompt settings**

  Setting this selector to "1" (OFF) deactivates all of the drum cleaning prompt settings enabled by selectors 5 to 7 of WSW42.

WSW31 (Function setting 9)

Selector No.	Function	Setting and Specifications
1	Not used.	
2	Default reduction rate for failure of automatic reduction during recording	0: 100% 1: 75% (Letter) 87% (A4) 95% (Legal)
3 4	Not used.	
5	Minimum short-OFF duration in distinctive ringing	0: 130 ms 1: 90 ms
6 7	Not used.	
⑧	"CHANGE DRUM SOON" message	0: Yes 1: No

- **Selector 2: Default reduction rate for failure of automatic reduction during recording**

  This selector sets the default reduction rate to be applied if the automatic reduction function fails to record one-page data sent from the calling station in a single page of the current recording paper.

  If it is set to "0," the machine records one-page data at full size (100%) without reduction; if it is set to "1," the machine records it at the size* specified according to the current paper size.

  (*American versions allow the user to select the desired paper size from the control panel. According to the paper size setting, the machine determines the reduction rate. Other versions can handle only A4-size paper, so the reduction rate is always 87%.)

- **Selector 5: Minimum short-OFF duration in distinctive ringing**

  The ringer pattern consists of short and long rings, e.g., short-short-long rings. This selector sets the minimum OFF duration following a short ring in order to avoid missing ringer tones in distinctive ringing.

  If this selector is set to "1," when the short-OFF duration is a minimum of 90 ms long, then the machine will interpret the short-OFF as OFF.

- **Selector 8: "CHANGE DRUM SOON" message**

  This selector determines whether or not the "CHANGE DRUM SOON" message should appear on the LCD when the service life of the laser-sensitive drum in the laser unit will expire soon.

WSW32 (Function setting 10)

Selector No.	Function	Setting and Specifications
1 | 4	Not used.	
5 6	Default resolution	No. 5 6 0 0 : Standard 0 1 : Fine 1 0 : Super fine 1 1 : Photo
7 8	Default contrast	No. 7 8 0 X : Automatic 1 0 : Super light 1 1 : Super dark

- **Selectors 5 and 6: Default resolution**

  These selectors set the default resolution which applies when the machine is powered up or completes a transaction.

- **Selectors 7 and 8: Default contrast**

  These selectors set the default contrast which applies when the machine is powered up or completes a transaction.

WSW33 (Function setting 11)

Selector No.	Function	Setting and Specifications
1 | 5	Not used.	
6	Report output of polled trans-mission requests	0: Yes 1: No
7 8	Not used.	

NOTE: Selector 6 is not applicable to American versions.

WSW34 (Function setting 12)

Selector No.	Function	Setting and Specifications
1 | 3	Not used.	
4 5	No. of CNG cycles to be detected (when the line is connected via the machine or external telephone in the external TAD mode)	No. 6 7 0 0 : 0.5 (A) 0 1 : 1 (B) 1 0 : 1.5 (C) 1 1 : 2 (D)
6 7	Number of DTMF tone signals for inhibiting the detection of CNG during external TAD operation	No. 6 7 0 0 : 3 0 1 : 2 1 0 : 1 1 1 : OFF
8	CNG detection when the external telephone is connected with a line in TAD mode	0: Only when the equipment detects itself being called 1: Always

NOTE: Selectors 4 and 5 are not applicable to the American version.

- **Selectors 4 and 5: No. of CNG cycles to be detected**

  The machine interprets a CNG as an effective signal if it detects a CNG signal by the number of cycles specified by these selectors when the line is connected via the machine or external telephone except in the external TAD mode.

- **Selectors 6 and 7: Number of DTMF tone signals for inhibiting the detection of CNG during external TAD operation**

  If the machine receives this specified number of DTMF tone signals during external TAD operation, it will not detect CNG afterwards.

  If these selectors are set to "1, 1," the CNG detection will not be inhibited.

- **Selector 8: CNG detection when the external telephone is connected with a line in TAD mode**

  If this selector is set to "0," the equipment will detect a CNG signal only when it detects itself being called. If the external telephone is connected with a line before the equipment detects itself being called, the equipment will no longer detect a CNG signal.

  If this selector is set to "1," the equipment will detect a CNG signal every time the external telephone is connected with a line, even without detecting itself being called.

WSW35 (Function setting 13)

Selector No.	Function	Setting and Specifications
1 | 8	Not used.	

WSW36 (Function setting 14)

Selector No.	Function	Setting and Specifications
①	ECP* mode	0: ON 1: OFF
②	Recovery from inactive PC interface	0: Disabled 1: Enabled
③	PC power-off recognition time	0: Normal 1: Long
4	Not used.	
5	Escape from phase C	0: Yes 1: No
6 | 8	Lower limit of frequency to be ignored after detection of calling signals (Ci)	No. 6 7 8 0 0 0 : 0 (Not ignored) 0 0 1 : 4 (448 Hz) 0 1 0 : 8 (244 Hz) 0 1 1 : 12 (162 Hz) 1 0 0 : 16 (122 Hz) 1 0 1 : 20 (97 Hz) 1 1 0 : 24 (81 Hz) 1 1 1 : 28 (69 Hz)

*ECP (Enhanced Capabilities Port)

- **Selector 1: ECP mode**

  The ECP mode enhances the normal bidirectional communications between the machine and the connected PC for higher transmission speed.

- **Selector 2: Recovery from inactive PC interface**

  If the machine recognizes via the STB signal line that the connected PC is powered off, it will turn the PC interface outputs Low to protect the PC from hazards that could be caused by weak electric current accidentally flown from the machine.

  This selector determines whether the machine should recover from the inactive PC interface to normal interfacing state upon receipt of data from the PC.

- **Selector 3: PC power-off recognition time**

  This selector sets the time length from when the machine detects the PC powered off until it recognizes the detected state as power-off.

  If selector 2 is set to "0," it is recommended that selector 3 be set to "1": otherwise, the machine may mistakenly detect PC powered off.

- **Selector 5: Escape from phase C**

  This selector determines whether or not the machine will escape from phase C when it detects an RTC (Return to Control) in non-ECM mode or an RCP (Return to Control Partial page) in ECM mode.

- **Selectors 6 through 8: Lower limit of frequency to be ignored after detection of calling signals (Ci)**

  At the start of reception, if the machine detects the frequency of calling signals (Ci) specified by selectors 1 through 4 of WSW14, it will start the ringer sounding. When doing so, the machine may fail to detect the calling signals normally due to noises superimposed at the time of reception. To prevent it, use selectors 6 through 8 of WSW36.

  If the machine detects higher frequencies than the lower limit specified by these selectors, it will regard them as noise and interpret that detecting state as being normal, allowing the ringer to keep sounding (until the machine starts automatic reception of FAX data if in the FAX mode, according to the preset number of ringers).

WSW37 (Function setting 15)

Selector No.	Function	Setting and Specifications
1	Printout of the stored image data of an unsent document onto the error report	0: No 1: Yes
2	Erasure of the stored image data of an unsent document at the time of the subsequent in-memory message transmission	0: No 1: Yes
3 | 8	Not used.	

- **Selector 1: Printout of the stored image data of an unsent document onto an error report**

  This selector determines whether or not the 1st-page image data of a document will be printed out onto the error report if the document image data stored in the temporary memory cannot be transmitted normally.

- **Selector 2: Erasure of the stored image data of an unsent document at the time of the subsequent in-memory message transmission**

  If in-memory message transmission fails repeatedly when selector 1 is set to "1," the temporary memory will be occupied with image data. Setting selector 2 to "1" will automatically erase the stored 1st-page image data of an unsent document at the time of the subsequent in-memory message transmission only when recording paper or toner runs out.

WSW38 (Function setting 16)

Selector No.	Function	Setting and Specifications
1 2	Setting of the equalizer	No. 1 2 0 X Automatic 1 0 : Fixed to 4 points 1 1 : Fixed to 16 points
3	Sending level of guard tone at phase 2	0: Normal - 7 db 1: Normal
4	Stepping down the transmission speed at fallback each	0: 2400 bps 1: 4800 bps
5 6	Automatic control of modem's EQM gain for proper transmission speed choice	No. 5 6 0 0 For higher transmission speed than the current setting 0 1 : No change from the current setting 1 0 : For lower transmission speed than the current setting 1 1 : For further lower transmission than the setting made by 1, 0
7	Redialing when a communications error occurs	0: ON 1: OFF
8	Not used.	

NOTE: WSW38 takes effect only in the V. 34 mode.

- **Selectors 1 and 2: Setting of the equalizer**

  These selectors set the equalizer's training level to be applied if the machine fails to send training due to weak line connection. If these selectors are set to "0, X," the modem will automatically set the appropriate training level.

- **Selector 3: Sending level of guard tone at phase 2**

  This selector sets the sending level of guard tone for 1800 Hz to be sent at Phase 2 in the V. 34 mode.

- **Selector 4: Stepping down the transmission speed at fallback each**

  This selector determines how much the modem steps down the transmission speed at fallback when called by the remote station. If this selector is set to "1," the modem may step down the transmission speed from 33600 bps to 28800 bps by one-time fallback.

- **Selectors 5 and 6: Automatic control of modem's EQM gain for proper transmission speed choice**

  These selectors determine how the modem controls the EQM (Eye Quality Monitor) gain for proper choice of the transmission speed, which applies if the modem selects higher transmission speed than the possible speed so that it always repeats falling back.

WSW39 (Function setting 17)

Selector No.	Function	Setting and Specifications
1 | 4	First transmission speed choice for fallback	No. 1 2 3 4 No. 5 6 7 8 0 0 0 0 : 2400 bps 0 0 0 1 : 4800 bps 0 0 1 0 : 7200 bps 0 0 1 1 : 9600 bps 0 1 0 0 : 12000 bps 0 1 0 1 : 14400 bps 0 1 1 0 : 16800 bps 0 1 1 1 : 19200 bps
5 | 8	Last transmission speed choice for fallback	1 0 0 0 : 21600 bps 1 0 0 1 : 24000 bps 1 0 1 0 : 26400 bps 1 0 1 1 : 28800 bps 1 1 0 0 : 31200 bps 1 1 0 1 : 33600 bps 1 1 1 0 : 33600 bps 1 1 1 1 : 33600 bps

NOTE: WSW39 takes effect only in V. 34 mode. For the transmission speed setting in other modes, refer to WSW19.

- **Selectors 1 through 8: First and last choices of transmission speed for fallback**

  These selectors are used to set the modem speed range. With the first transmission speed choice specified by selectors 1 through 4, the machine attempts to establish the transmission link via the modem. If the establishment fails, the machine automatically steps down to the next highest speed and attempts to establish the transmission link again. The machine repeats this sequence while stepping down the transmission speed to the last choice specified by selectors 5 through 8.

  If the modem always falls back to a low transmission speed (e.g., 24,000 bps), set the first transmission speed choice to the lower one (e.g., modify it from 31,200 bps to 26,400 bps) in order to deactivate the high-speed modem function and reduce the training time for shorter transmission time.

  WSW39 will be limited by selectors 3 through 8 of WSW40.

WSW40 (Function setting 18)

Selector No.	Function	Setting and Specifications
1	Not used.	
2	Automatic paper cassette choice in copying	0: Disabled (Fixed to upper paper cassette) 1: Enabled
3 | 8	Masking of symbol rate(s)	Not masking Masking No. 3 0 1 3429 symbols/sec No. 4 0 1 3200 symbols/sec No. 5 0 1 3000 symbols/sec No. 6 0 1 2800 symbols/sec No. 7 - - Not used. No. 8 0 1 2400 symbols/sec

NOTE: WSW40 takes effect only in the V. 34 mode.

NOTE: Selector 2 is applicable only to models equipped with a flat-bed scanner.

- **Selector 2: Automatic paper cassette choice in copying**

  If an optional lower cassette is loaded and you have set either of the upper and lower cassettes as being loaded with longer paper from the control panel, then the facsimile equipment may automatically select either of those cassettes in copying depending upon the document length scanned by the ADF.

- **Selectors 3 and 8: Masking of symbol rate(s)**

  These selectors allow you to limit the transmission speed range in the V. 34 mode by masking the desired symbol rate(s). Transmission speeds assigned to the symbol rates are listed below. The setting made by these selectors will limit the setting made by selectors 1 through 4 of WSW39.

  If selector 3 is set to "1" to mask the 3429 symbols/second when the first transmission speed choice is 33600 bps (specified by selectors 1 through 4 of WSW39), for example, the allowable maximum transmission speed will be limited to 31200 bps. If selector 8 is set to "1" to mask the 2400 symbols/second when the first transmission speed choice is 33600 bps, then the allowable maximum transmission speed remains 33600 bps.

  If selector 8 is set to "1" to mask the 2400 symbols/second when the first transmission speed choice is 21600 bps (specified by selectors 1 through 4 of WSW39), the allowable maximum transmission speed remains 21600 bps but the minimum transmission speed will be limited to 4800 bps.

Symbol rate	Transmission speed (bps)	Symbol rate	Transmission speed (bps)	Symbol rate	Transmission speed (bps)
2400	2400	3000	4800	3429	4800
	4800		7200		7200
	7200		9600		9600
	9600		12000		12000
	12000		14400		14400
	14400		16800		16800
	16800		19200		19200
	19200		21600		21600
	21600		24000		24000
2800	4800		26400		28800
	7200		28800		31200
	9600	3200	4800		33600
	12000		7200		
	14400		9600		
	16800		12000		
	19200		14400		
	21600		16800		
	24000		19200		
	26400		21600		
			24000		
			26400		
			28800		
			31200		

WSW41 (Function setting 19)

Selector No.	Function	Setting and Specifications
1 | 3	ON-duration of the fluorescent lamp built in the CCD unit	No. 1 2 3 0 0 0 : 16 hours 0 0 1 : 24 hours 0 1 0 : 12 hours 0 1 1 : 8 hours 1 0 0 : 4 hours 1 0 1 : 2 hours 1 1 0 : 10 minutes 1 1 1 : 0 minute
4	Not used.	
5 | 8	Modem attenuator	No. 5 6 7 8 0 0 0 0 : -10 dBm 0 0 0 1 : -11 dBm 0 0 1 0 : -12 dBm 0 0 1 1 : -13 dBm 0 1 0 0 : -14 dBm | | 1 1 1 1 : -25 dBm

NOTE: WSW41 takes effect only in the V. 34 mode.

NOTE: Selectors 1 through 3 are applicable only to models equipped with a flat-bed scanner.

- **Selectors 1 through 3: ON-duration of the fluorescent lamp built in the CCD unit**

  If the scanning operation is started when the fluorescent lamp is off, then the lamp will come on for scanning. These selectors determine how long the lamp will stay ON after scanning.

  If these selectors are set to "1, 1, 1," the fluorescent lamp will go off after the scanning sequence.

- **Selectors 5 through 8: Modem attenuator**

  These selectors are used to adjust the transmitting level of the modem when the reception level at the remote station is improper due to line loss. This function applies to super G3 protocol signals.

WSW42 (Function setting 20)

Selector No.	Function	Setting and Specifications
1	Incoming mail server POP*[1]	0: OFF 1: ON
2	Incoming mail server SMTP*[2]	0: OFF 1: ON
3	Internet-FAX forward function	0: OFF 1: ON
4	JBIG*[3] coding system	0: Disabled 1: Enabled
⑤	Alarm message when the corona wire abnormally emits ions	0: Enabled 1: Disabled
⑥	Issue of a drum cleaning prompting sheet when the corona wire abnormally emits ions	0: Enabled 1: Disabled
⑦	Issue of a drum cleaning prompting sheet when the specified number of pages has been printed	0: Enabled 1: Disabled
8	Not used.	

*[1] POP: Post Office Protocol
*[2] SMTP: Simple Mail Transfer Protocol
*[3] JBIG: Joint Bi-level Image Group

NOTE: Selectors 1 through 3 are applicable to those models equipped with LAN interface.

NOTE: Selectors 5 through 7 take effect only when selector 5 of WSW30 is set to "ON" (0).

- **Selector 3: Internet-FAX forward function**

  If this selector is set to "ON," the machine may forward a FAX message received through Internet to other remote G3 facsimile equipment.

- **Selector 5: Alarm message when the corona wire abnormally emits ions**

  This selector determines whether or not the alarm message "PLS CLEAN DRUM" will appear on the LCD when the corona wire abnormally emits ions.

- **Selector 6: Issue of drum cleaning prompting sheet when the corona wire abnormally emits ions**

  This selector determines whether or not a drum cleaning prompting sheet will be printed out when the corona wire abnormally emits ions. The sheet prompts the user to clean the corona wire of the laser-sensitive drum.

- **Selector 7: Issue of a drum cleaning prompting sheet when the specified number of pages has been printed**

  This selector determines whether or not a drum cleaning prompting sheet will be printed out when the specified number of pages has been printed (that is, when it is assumed that the corona wire becomes dirty). The sheet prompts the user to clean the corona wire of the laser-sensitive drum.

WSW43 (Function setting 21)

Selector No.	Function	Setting and Specifications
1	Addition of a header (station ID) to FAX images to be sent to PCs having e-mail addresses	0: Yes 1: No
2 3	Wait time for PCFax reception (Class 2) and FPTS command transmission	No. 2 3 0 0 : 50 ms 0 1 : 100 ms 1 0 : 150 ms 1 1 : 0 ms
4 5	Detection time of 2100 Hz CED or ANSam	No. 4 5 0 0 : 200 ms 0 1 : 300 ms 1 0 : 400 ms 1 1 : 500 ms
6 | 8	Not used.	

NOTE: Selector 1 is applicable to those models equipped with LAN interface.

WSW44 (Speeding up scanning-1)

Selector No.	Function	Setting and Specifications
1 | 5	Not used.	
6 | 8	Effective time length of the white level compensation data obtained beforehand	No. 6 7 8 0 0 0 : Obtained compensation data ineffective 0 0 1 : 1 min. 0 1 0 : 3 min. 0 1 1 : 5 min. 1 0 0 : 10 min. 1 0 1 : 15 min. 1 1 0 : 20 min. 1 1 1 : 30 min.

NOTE: WSW44 is applicable only to models equipped with a flat-bed scanner.

- **Selectors 6 through 8: Effective time length of the white level compensation data obtained beforehand**

  If you set documents in the ADF and the document front sensor detects them or if you open the document tray ASSY and the document tray open sensor detects the open state, then the controller will make correction of the reference voltage to be applied to white level compensation for document scanning before the Copy button is pressed.

  These selectors determine how long compensation data obtained beforehand will keep effective.

WSW45 (Speeding up scanning-2)

Selector No.	Function	Setting and Specifications
1 | 3	Delay time from when documents are set until the ADF starts drawing them in	No. 1 2 3 0 0 0 : No automatic drawing-in 0 0 1 : 1 sec. 0 1 0 : 2 sec. 0 1 1 : 3 sec. 1 0 0 : 4 sec. 1 0 1 : 5 sec. 1 1 0 : 6 sec. 1 1 1 : 7 sec.
4 | 6	Periodical correction intervals of the reference voltage to be applied to white level compensation for document scanning, during standby	No. 4 5 6 0 0 0 : No correction of reference voltage during standby 0 0 1 : 10 sec. 0 1 0 : 30 sec. 0 1 1 : 1 min. 1 0 0 : 3 min. 1 0 1 : 5 min. 1 1 0 : 10 min. 1 1 1 : 30 min.
7	Standby position of the CCD unit	0: CCD lock position (Home position) 1: Location of the white-level reference film
8	Not used.	

NOTE: WSW45 is applicable only to models equipped with a flat-bed scanner.

- **Selectors 1 through 3: Delay time from when documents are set until the ADF starts drawing them in**

  These selectors determine how long the ADF will delay automatic drawing-in of documents (to the scanning standby position) after you set them in the ADF, as well as determining whether or not the ADF automatically draws in documents.

- **Selectors 4 through 6: Periodical correction intervals of the reference voltage applied to white level compensation for document scanning, during standby**

  These selectors set the correction intervals (in seconds) of the reference voltage to be applied to white level compensation for document scanning during standby, as well as determining whether or not the controller makes the reference voltage correction during standby. (Conventionally, the correction has been made immediately before the start of actual scanning)

  This function takes effect in copying. Making the correction during standby may shorten the preparation time for copying.

  NOTE: Do not access these selectors.

- **Selector 7: Standby position of the CCD unit**

  This selector determines whether the standby position of the CCD unit should be the CCD lock position (home position) or the location of the white-level reference film (attached to the inside of the scanner top cover). If the location of the reference film is selected, the CCD unit will not return to the lock position so as to shorten the travel time, decreasing the preparation time for copying.

WSW46 (Monitor of power ON/OFF state and parallel port kept at high)

Selector No.	Function	Setting and Specifications
1 2	Monitoring the PC ON/OFF state	No. 1 2 0 0 : Disabled 0 1 : Monitor SELECT IN 1 0 : Monitor STROBE 1 1 : Monitor both SELECT IN and STROBE
3	Parallel port output pins kept at high level	
4 | 8	Not used.	

NOTE: Selector 3 is applicable only to models equipped with a parallel interface.

- **Selectors 1 and 2: Monitoring the PC ON/OFF state**

  For the related functions, refer to WSW36, selectors 2 and 3.

- **Selector 3: Parallel port output pins kept at high level**

  Setting this selector to "0" will keep all parallel output pints of the facsimile equipment at high level. Use this setting if Resource Manager (bundled with MFC models) installed to WindowsNT running on the connected PC fails to monitor the power ON/OFF state of the facsimile equipment.

WSW47 (Delay of FAX line disconnection)

Selector No.	Function	Setting and Specifications
1 2	Not used.	
3 4	Delay of FAX line disconnection when switching to the pseudo-ringing external telephone	No. 3 4 0 0 : 200 ms 0 1 : 400 ms 1 0 : 700 ms 1 1 : 1000 ms
5 | 8	Not used.	

NOTE: Selectors 3 and 4 are applicable only to models supporting pseudo-ringing of a connected external telephone.

- **Selectors 3 and 4: Delay of FAX line disconnection when switching to the pseudo-ringing external telephone**

  When the equipment receives a phone call, it can make the connected external telephone ring (so called pseudo-ringing). During pseudo-ringing, if you pick up the handset of the external telephone, the line might be disconnected due to cut-off of the line current.

  To hold the line, the equipment may supply line current by making use of the pulse generator circuit that forms a parallel loop. This way the FAX line disconnection may be delayed. These selectors determine the delay period.

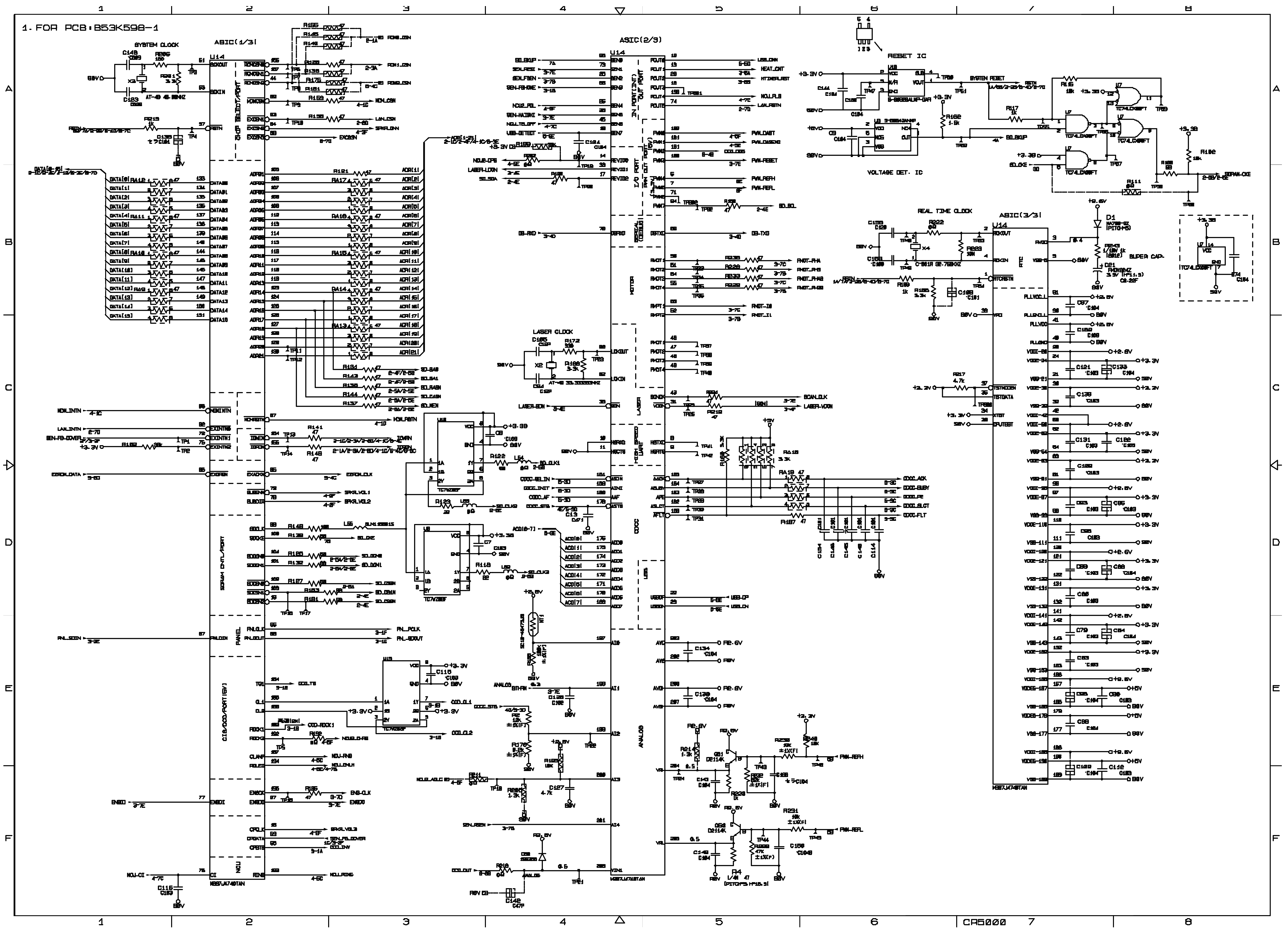
WSW48 to WSW50

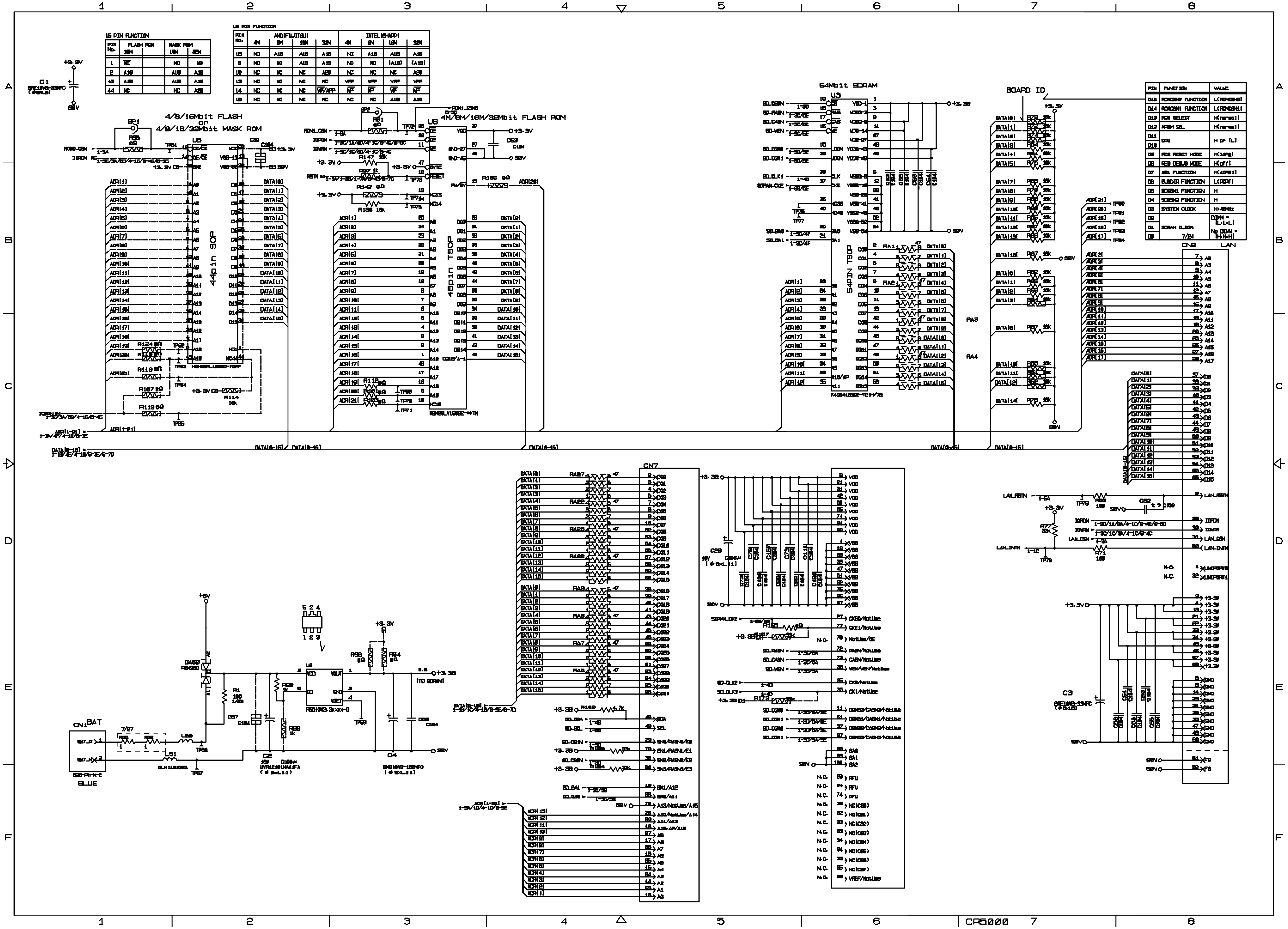
Selector No.	Function	Setting and Specifications
1 | 8	Not used.	

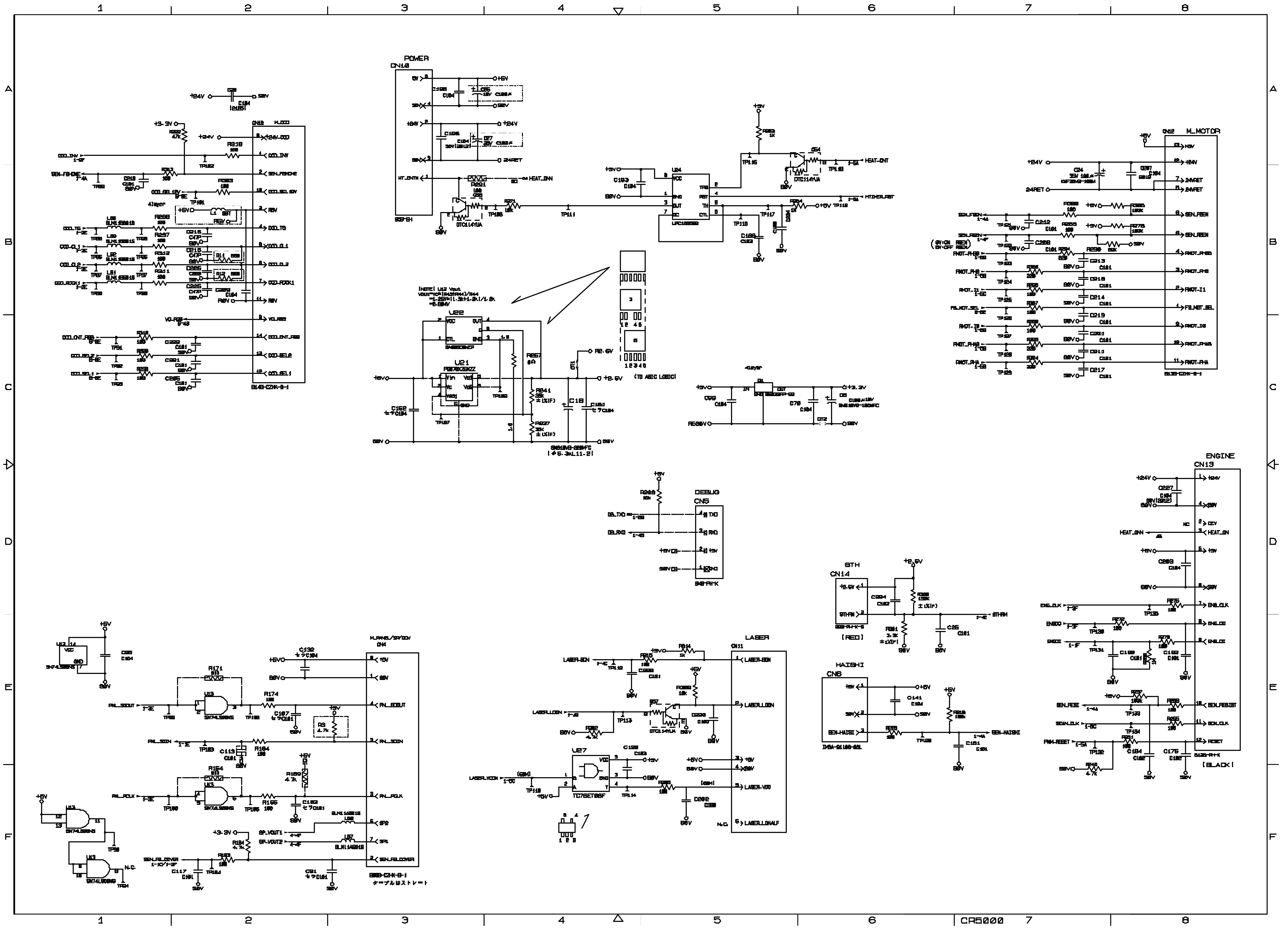
MFC9800/MFC9700/DCP1400
MFC9880/MFC9860/MFC9760

Appendix 3. Circuit Diagrams

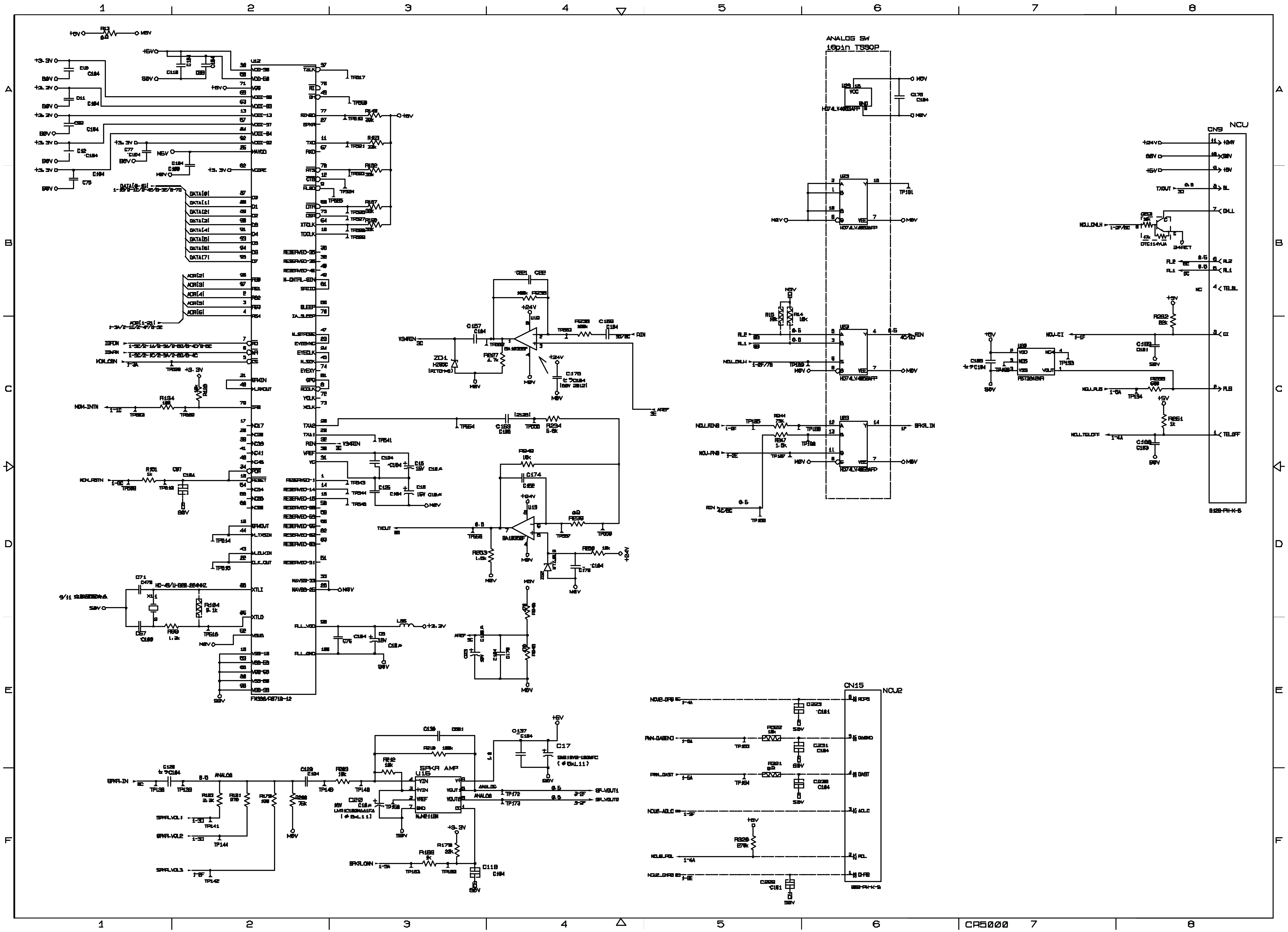
A. Main PCB (MFC9800/MFC9880/MFC9860/MFC9760)
   Main PCB (MFC9700/DCP1400)
B. Relay PCB
C. Engine PCB
D. Network Control Unit (NCU) PCB
E. Control Panel PCB
F. Power Supply PCBs

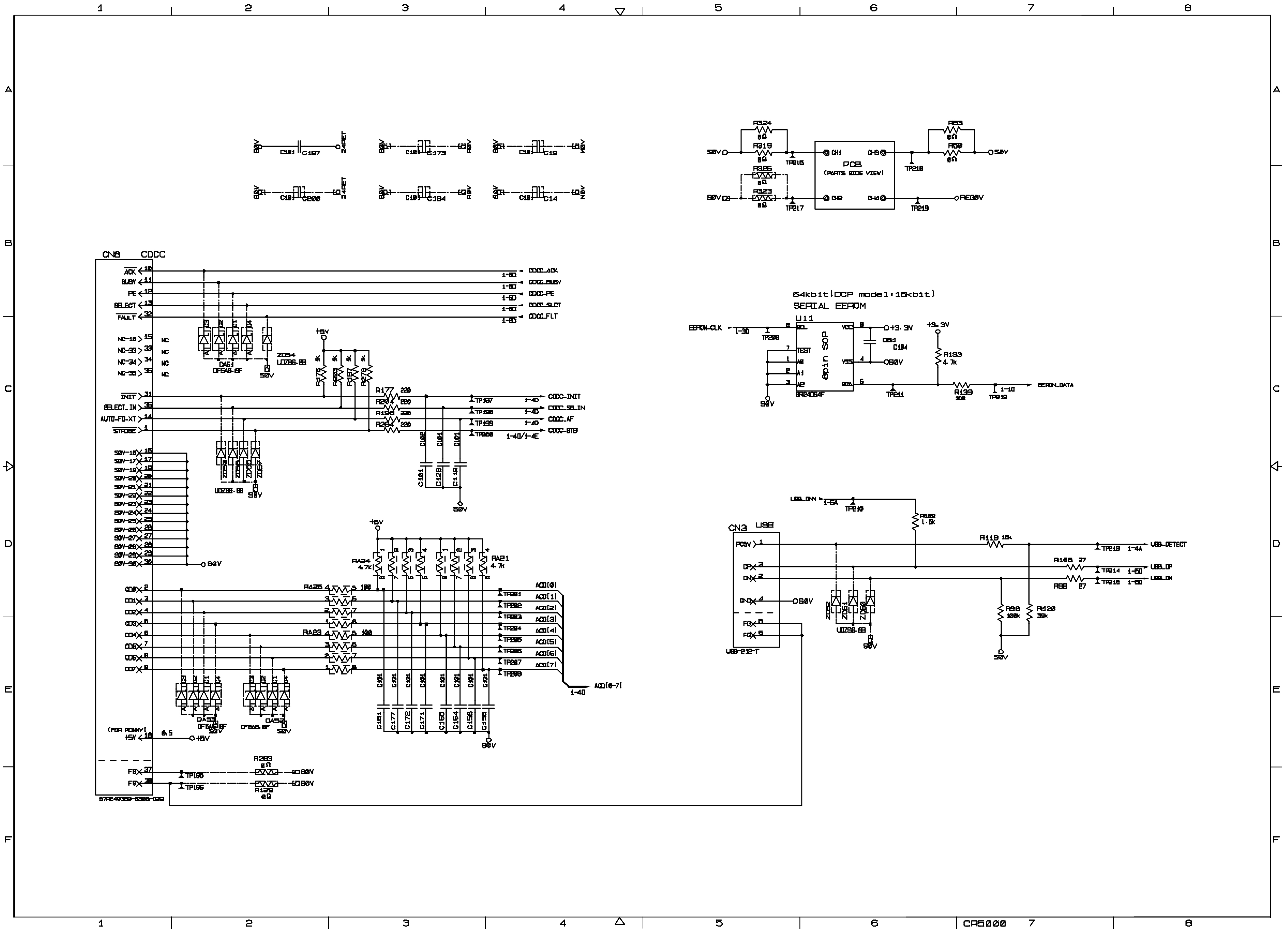



4/8/16Mbit FLASH
or
4/8/16/32Mbit MASK ROM
44pin SOP
4M/8M/16M/32Mbit FLASH ROM
48pin TSOP
64Mbit SDRAM
54PIN TSOP
BOARD ID
LAN
BAT
BLUE
CR5000

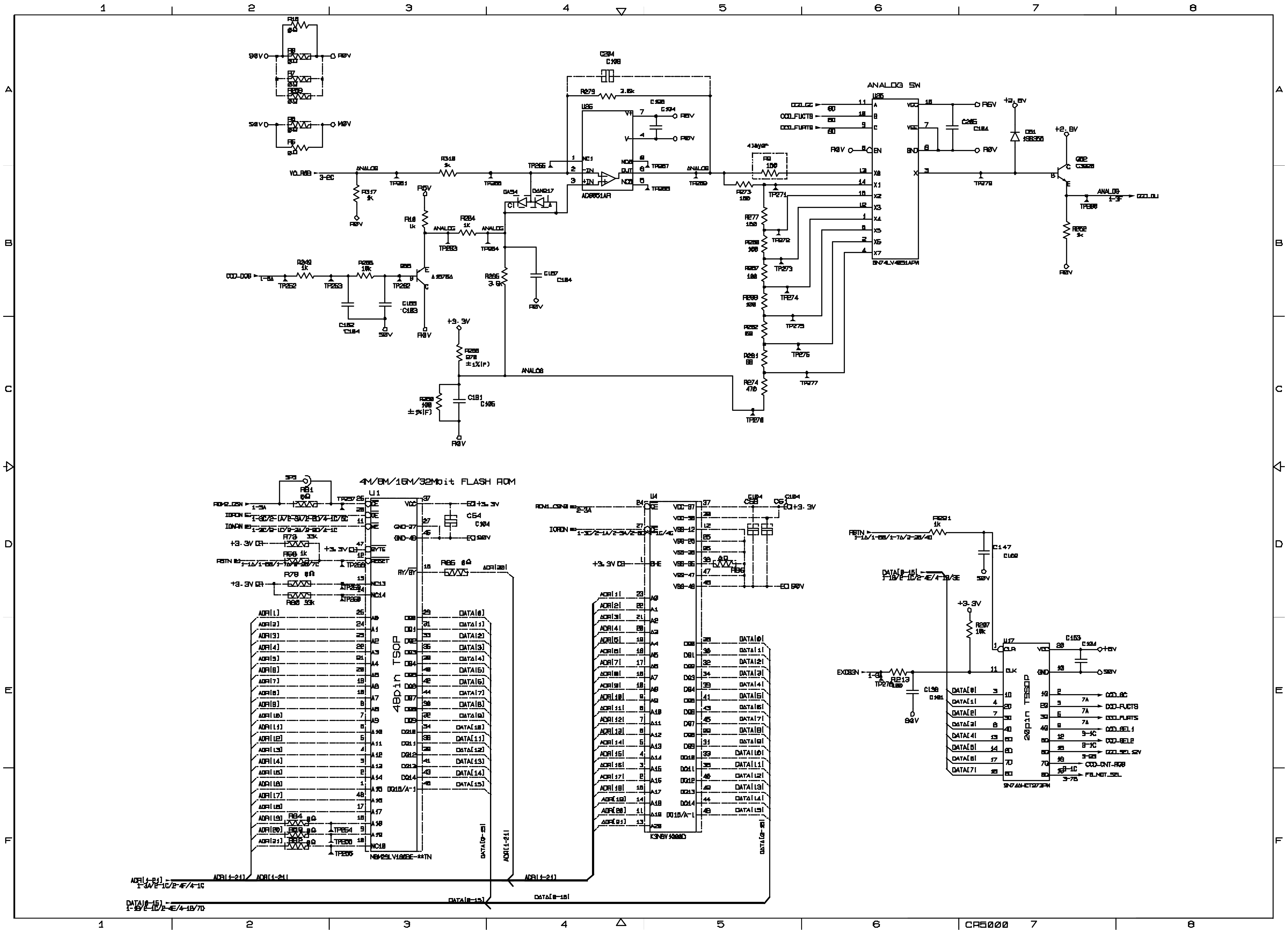


A. Main PCB (4/6)
(MFC9800/MFC9880/MFC9860/MFC9760)



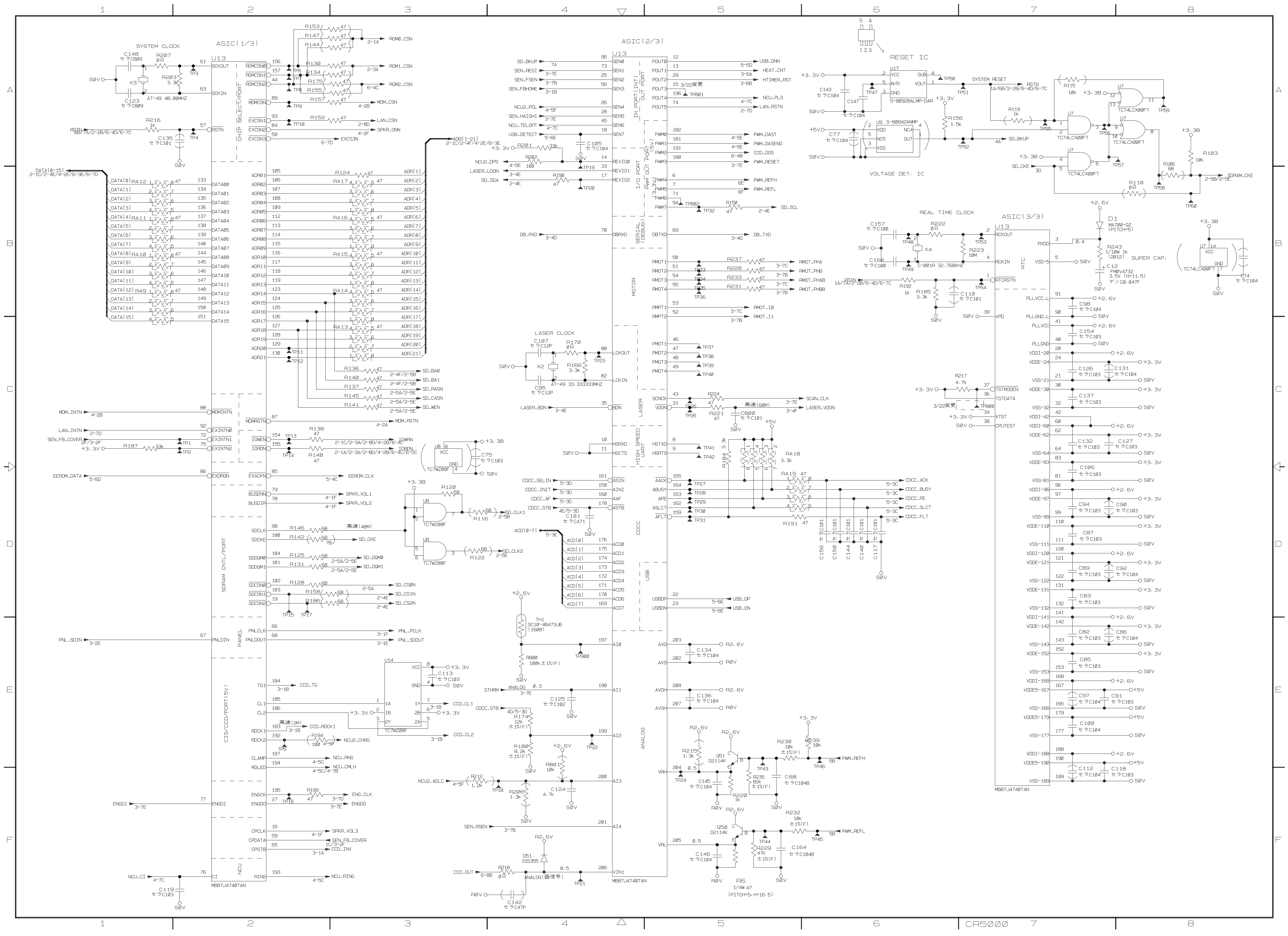


A. Main PCB (6/6)
(MFC9800/MFC9880/MFC9860/MFC9760)

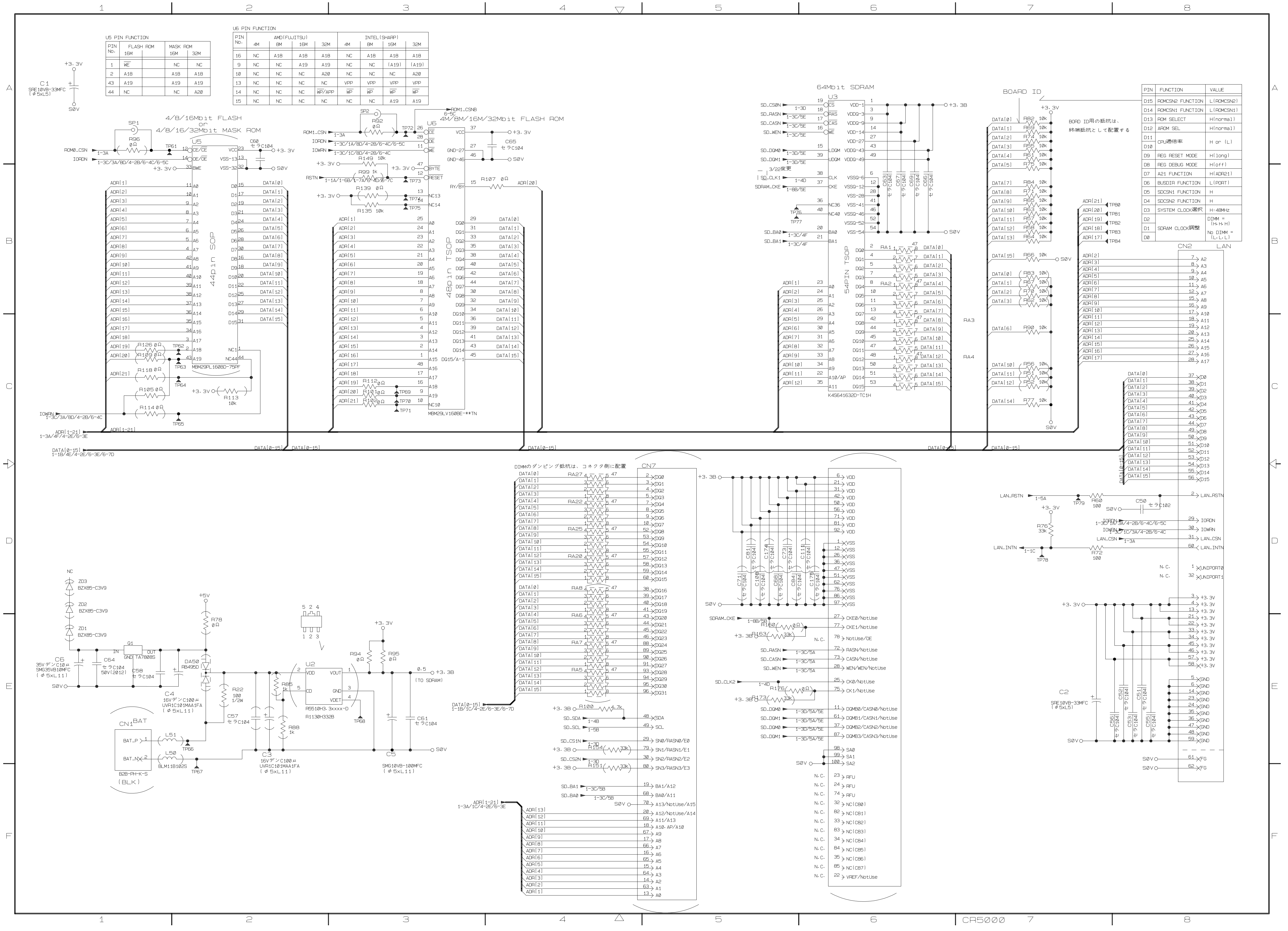


A. Main PCB (1/6)

(MFC9700/DCP1400)



A. Main PCB (2/6)
(MFC9700/DCP1400)



U5 PIN FUNCTION

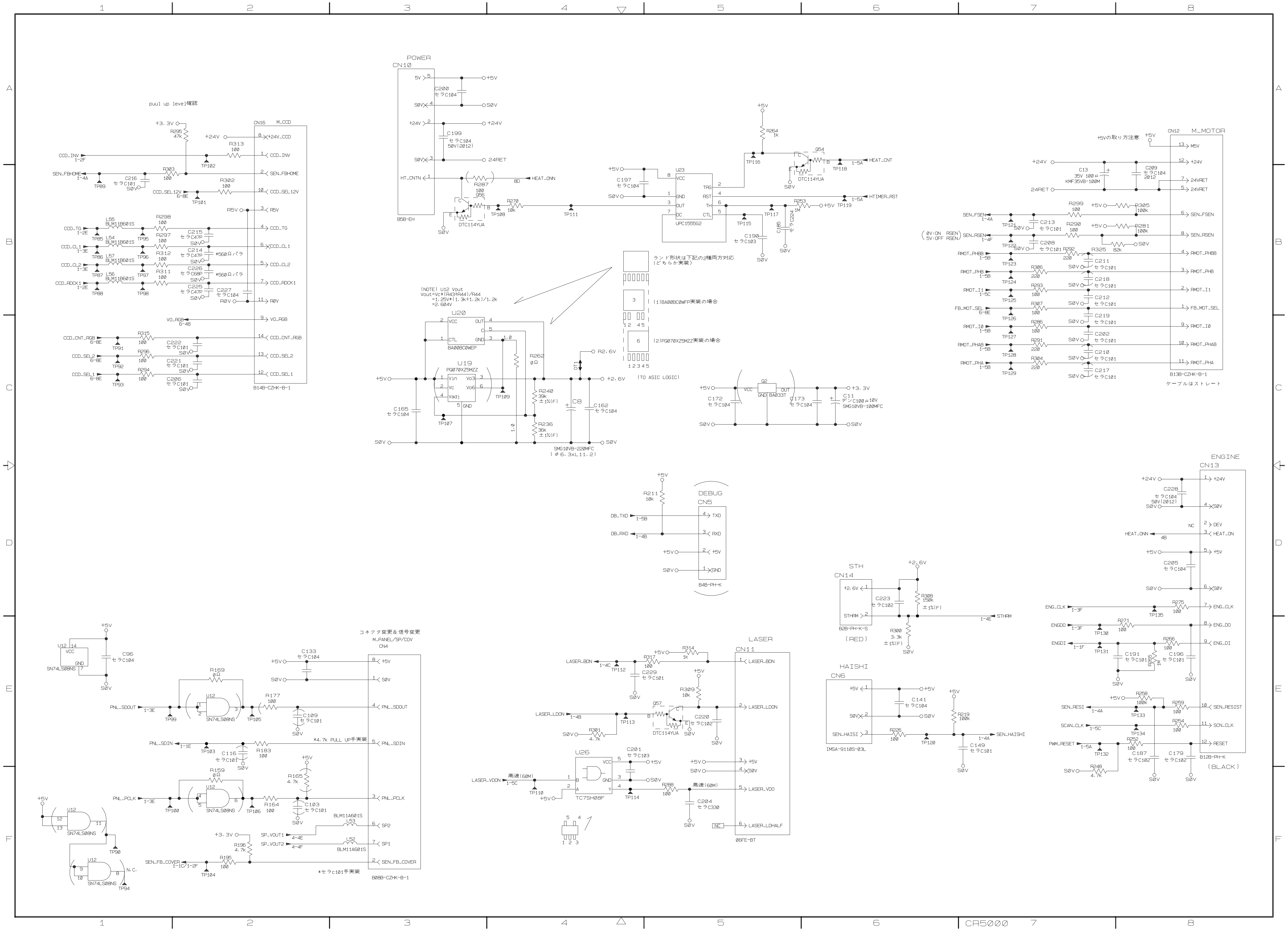
PIN No.	FLASH ROM 16M	MASK ROM 16M	MASK ROM 32M
1	WE	NC	NC
2	A18	A18	A18
43	A19	A19	A19
44	NC	NC	A20

U6 PIN FUNCTION

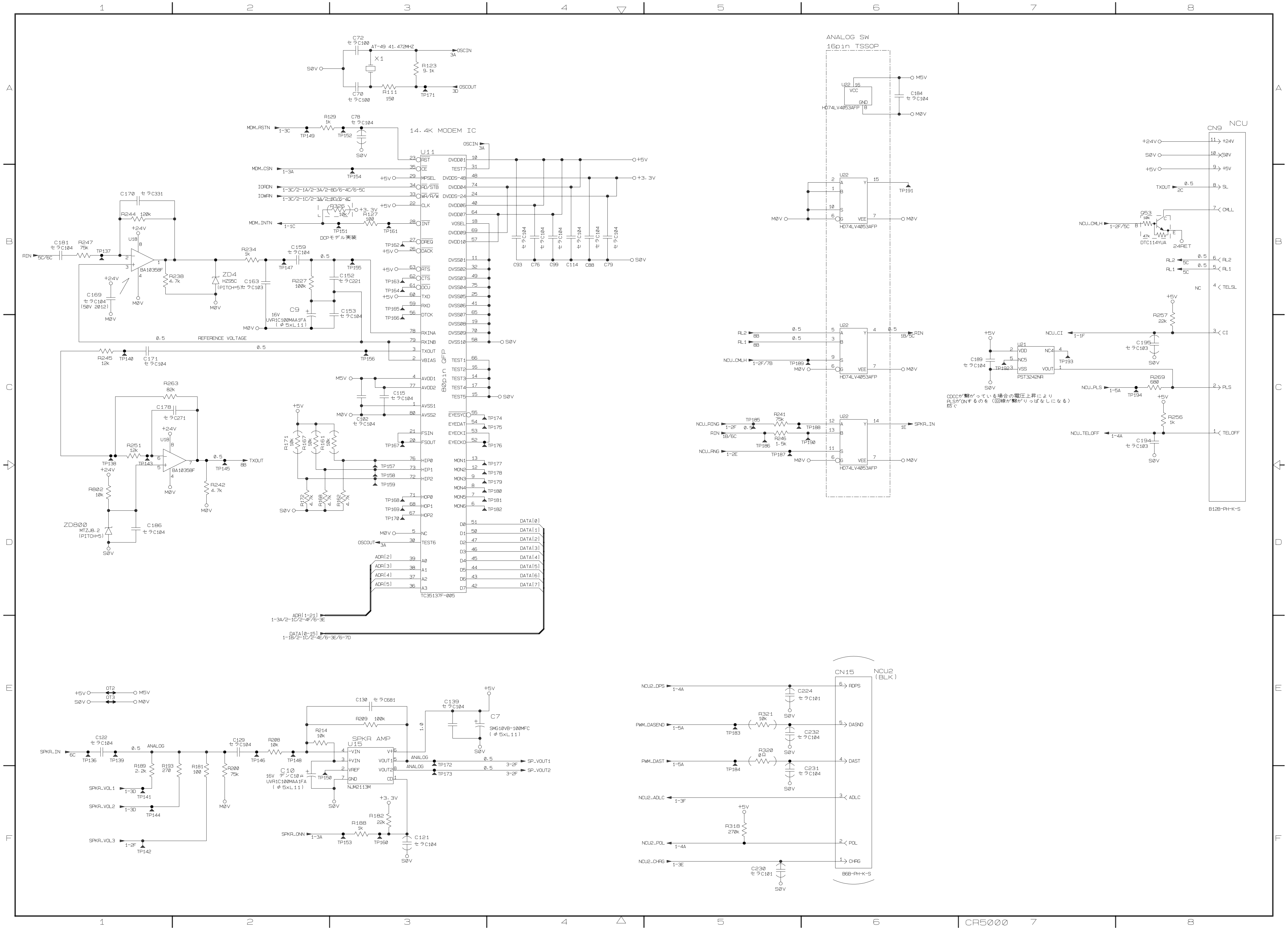
PIN No.	AMD(FUJITSU) 4M	8M	16M	32M	INTEL(SHARP) 4M	8M	16M	32M
16	NC	A18	A18	A18	NC	A18	A18	A18
9	NC	NC	A19	A19	NC	NC	(A19)	(A19)
10	NC	NC	NC	A20	NC	NC	NC	A20
13	NC	NC	NC	NC	VPP	VPP	VPP	VPP
14	NC	NC	NC	WP/APP	WP	WP	WP	WP
15	NC	NC	NC	NC	NC	NC	A19	A19

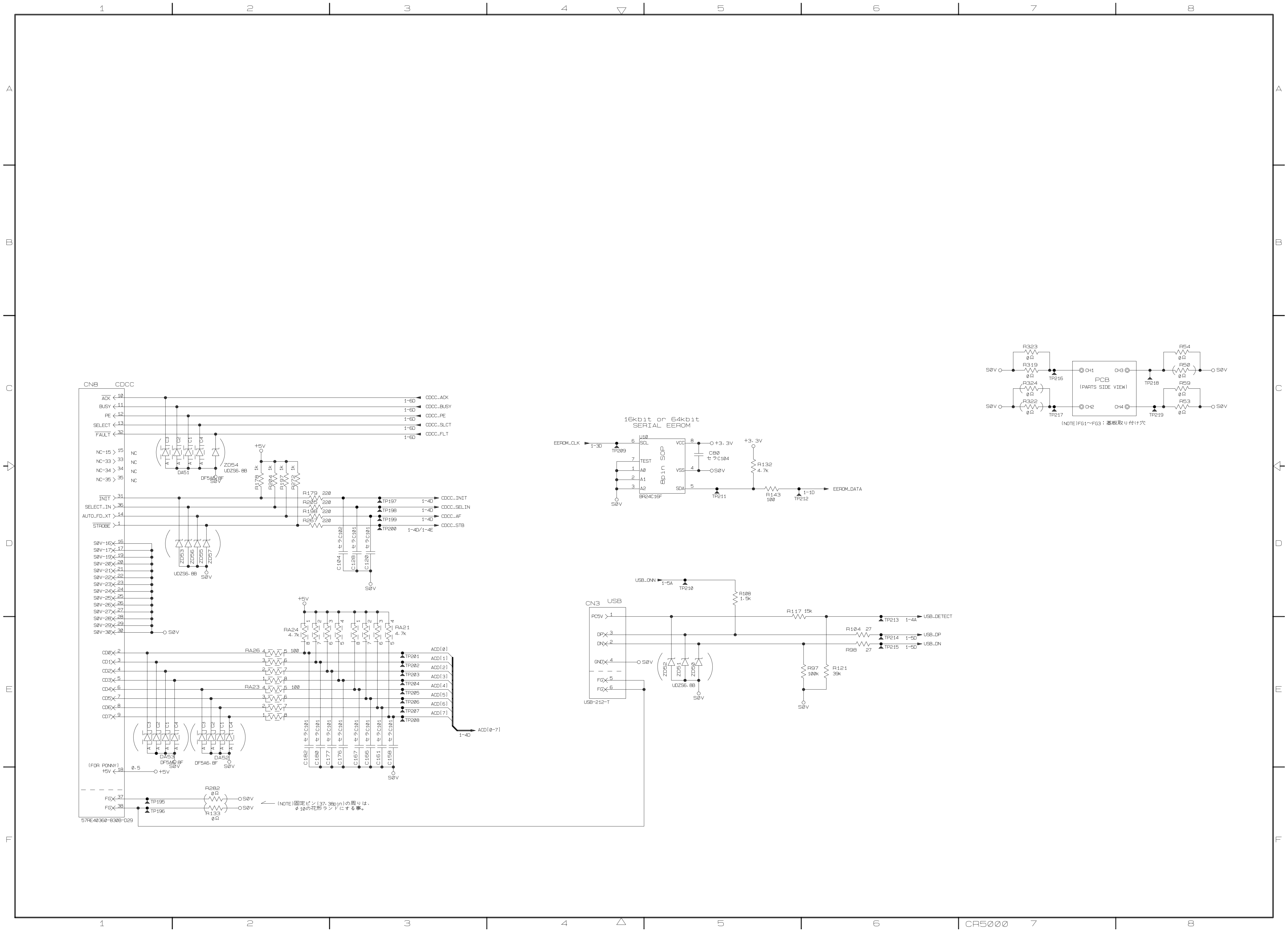
PIN	FUNCTION	VALUE
D15	ROMCSN2 FUNCTION	L(ROMCSN2)
D14	ROMCSN1 FUNCTION	L(ROMCSN1)
D13	ROM SELECT	H(normal)
D12	AROM SEL	H(normal)
D11 D10	CPU逓倍率	H or (L)
D9	REG RESET MODE	H(long)
D8	REG DEBUG MODE	H(off)
D7	A21 FUNCTION	H(ADR21)
D6	BUSDIR FUNCTION	L(PORT)
D5	SDCSN1 FUNCTION	H
D4	SDCSN2 FUNCTION	H
D3	SYSTEM CLOCK選択	H:48MHz
D2 D1	SDRAM CLOCK調整	DIMM = (H-H-H) No DIMM = (L-L-L)
D0		

A. Main PCB (3/6)
(MFC9700/DCP1400)

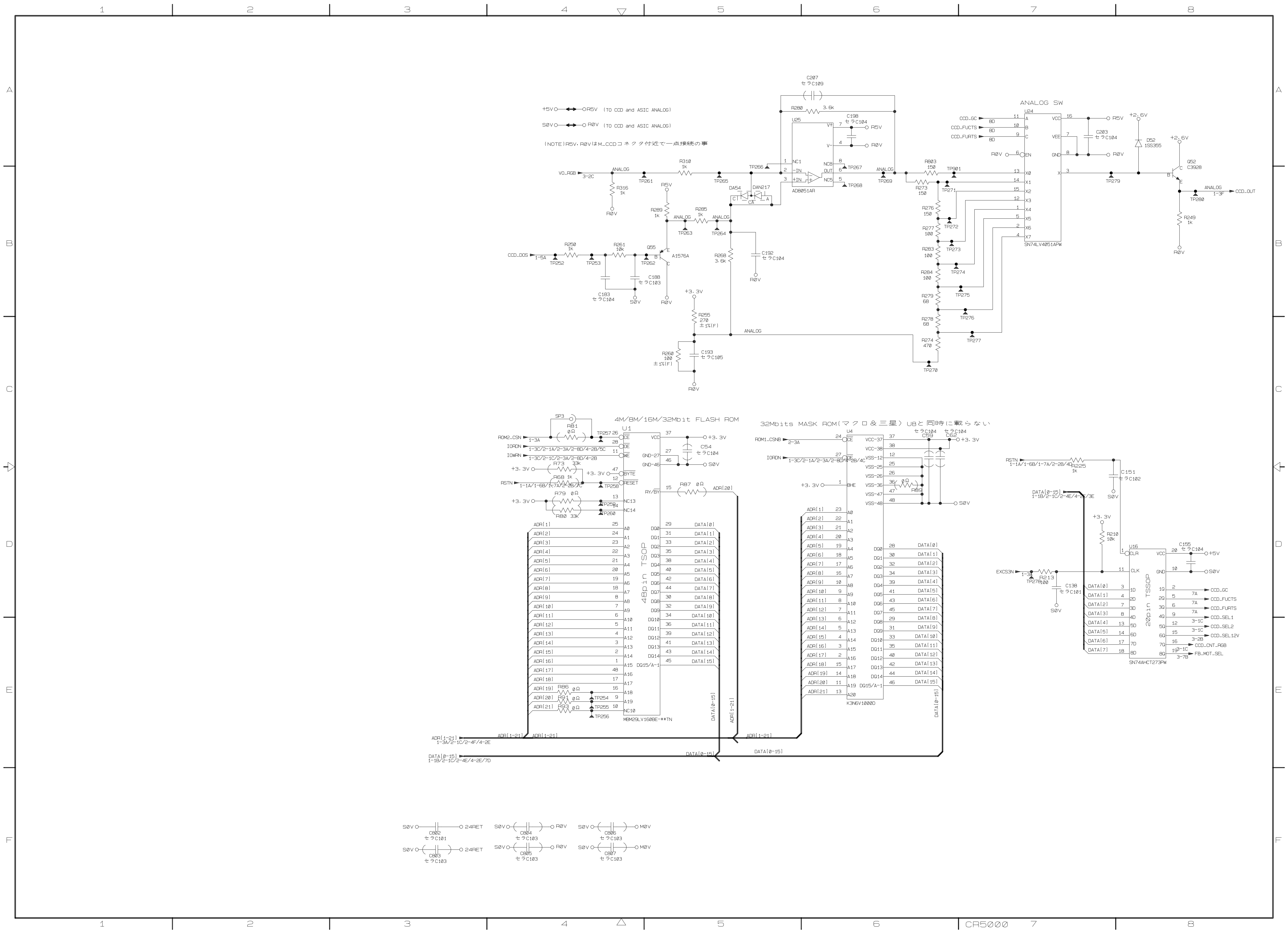


A. Main PCB (4/6)
(MFC9700/DCP1400)

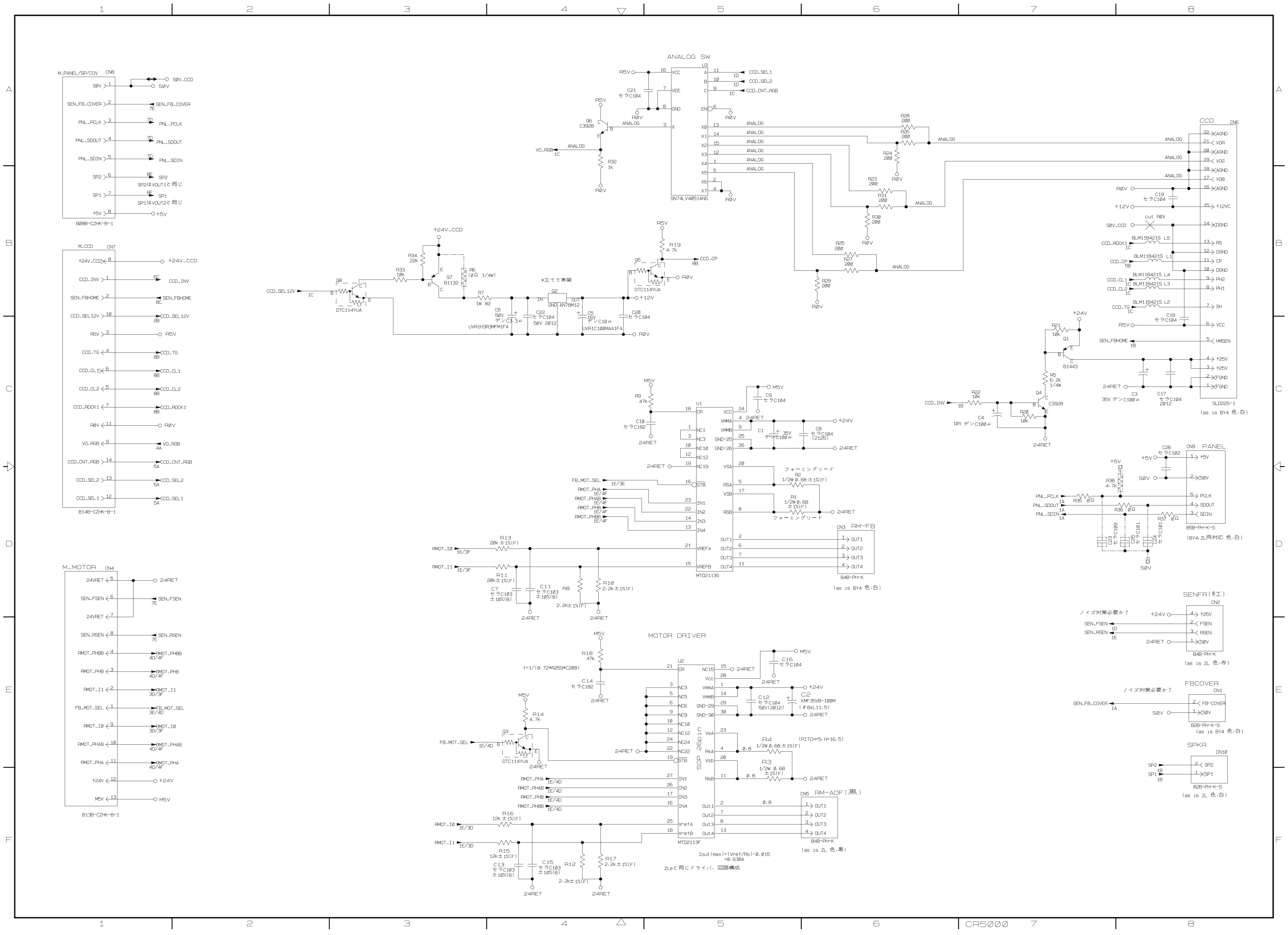




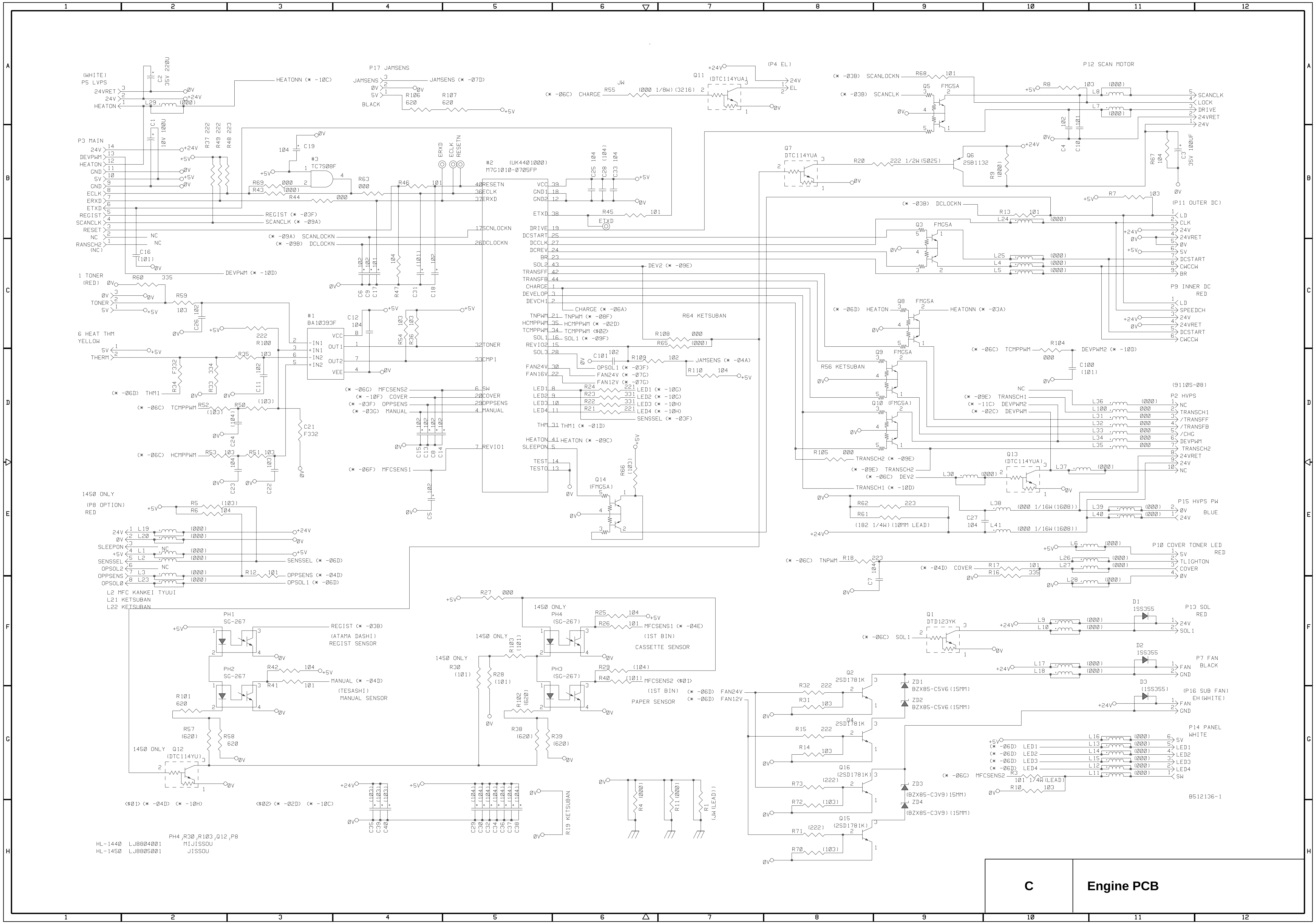
A. Main PCB (6/6)
(MFC9700/DCP1400)



B. Relay PCB

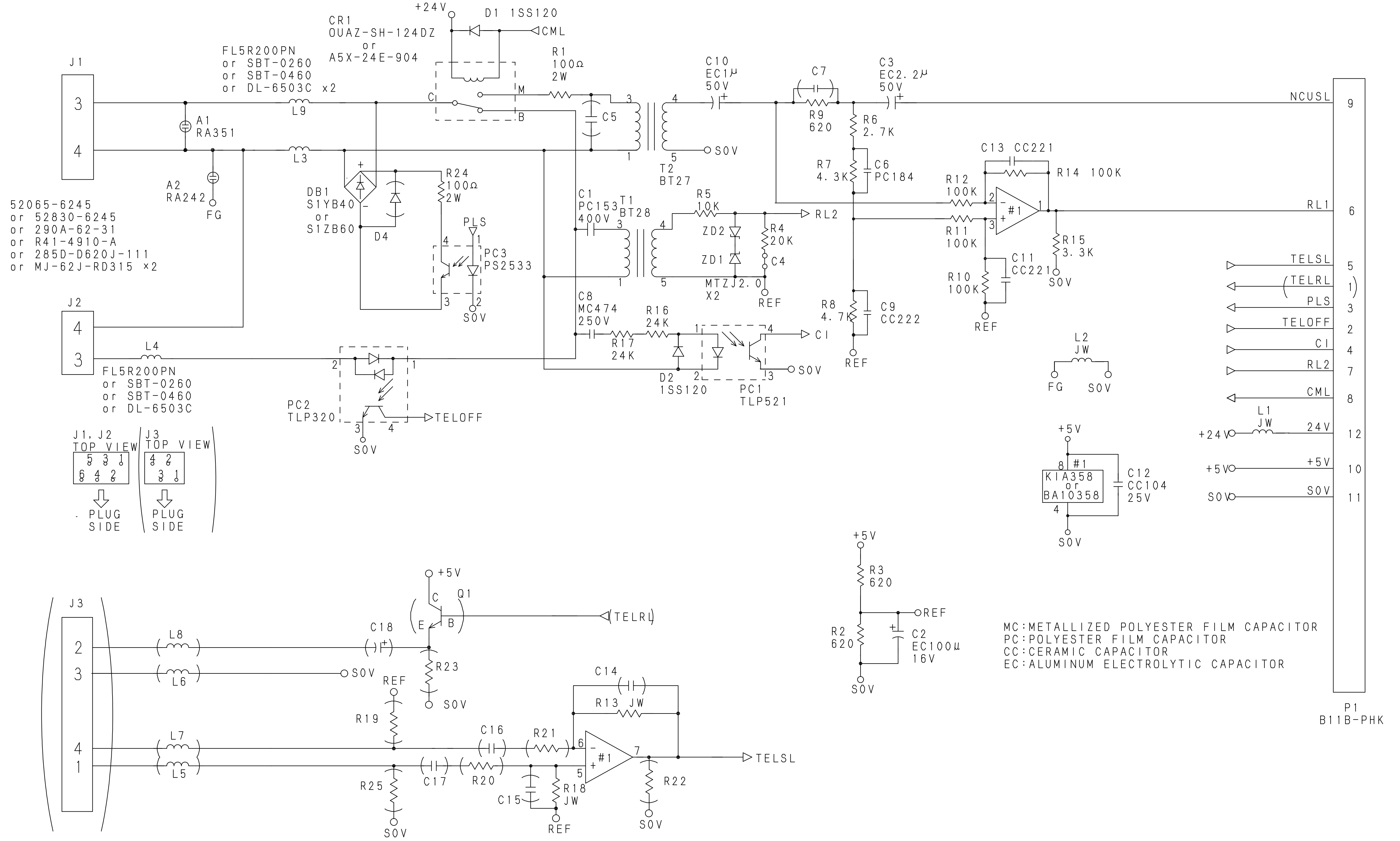


ANALOG SW
MOTOR DRIVER
M_PANEL/SP/COV
M_CCD
M_MOTOR
CCD
PANEL
RM-FB
RM-ADF(黒)
SENFR(紅)
FBCOVER
SPKR
SN74LV4051ANS
MTD2113G
MTD2113F
CR5000

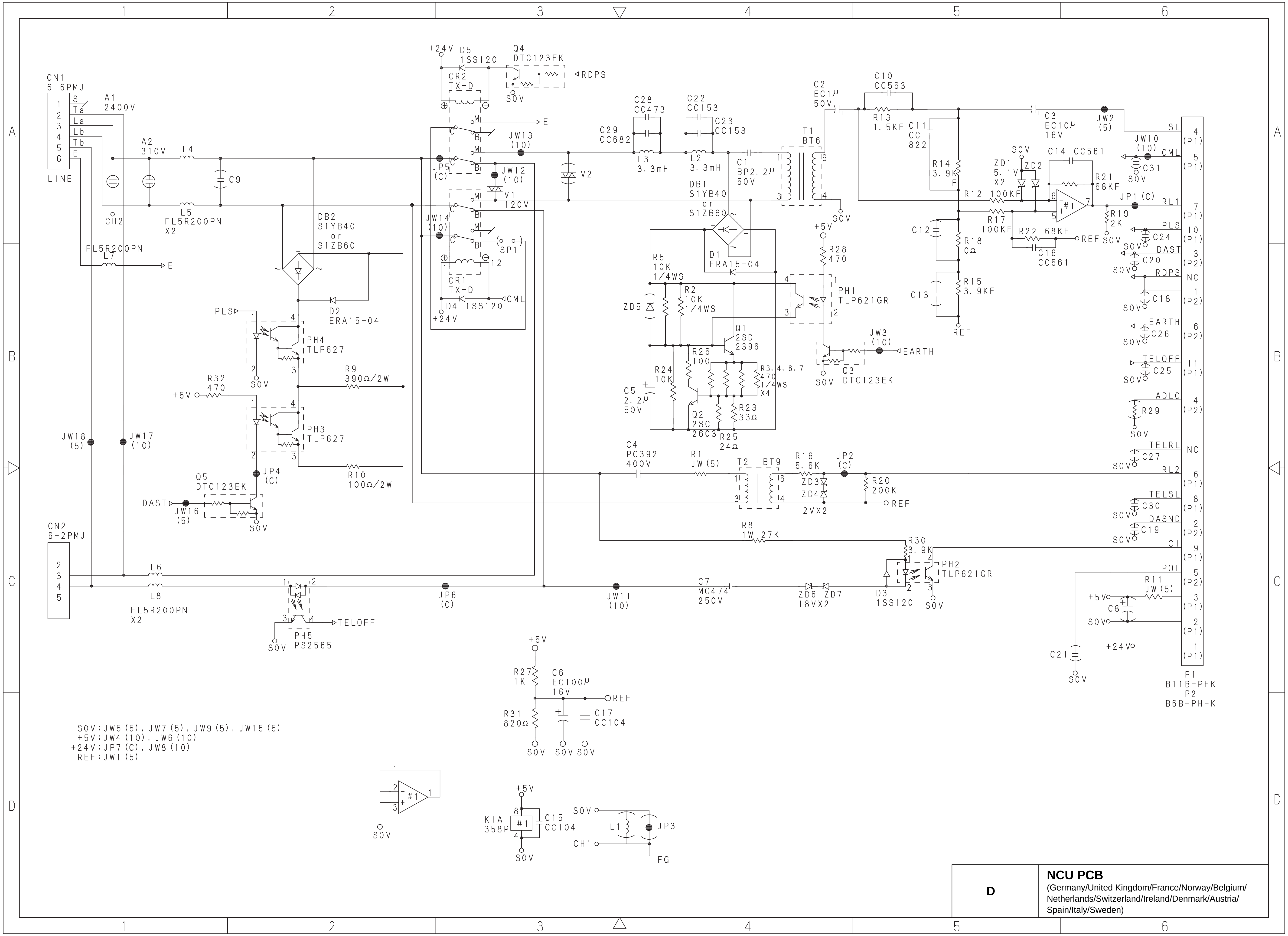


C	Engine PCB

1. 指示ナキ抵抗ノ消費電力ハ1／4Wトスル。
1. UNLESS OTHERWISE SPECIFIED, POWER CONSUMPTION OF RESISTORS IS 1/4W.
2. 指示ナキコンデ゛ンサノ耐圧ハ25V又ハ50Vトスル。
2. UNLESS OTHERWISE SPECIFIED, THE VOLTAGE RESISTANCE OF CAPACITORS IS 25V OR 50V.
3. ( )内ノ部品ハ未実装トスル。
3. COMPONENTS IN PARENTHESIS NOT TO BE MOUNTED.

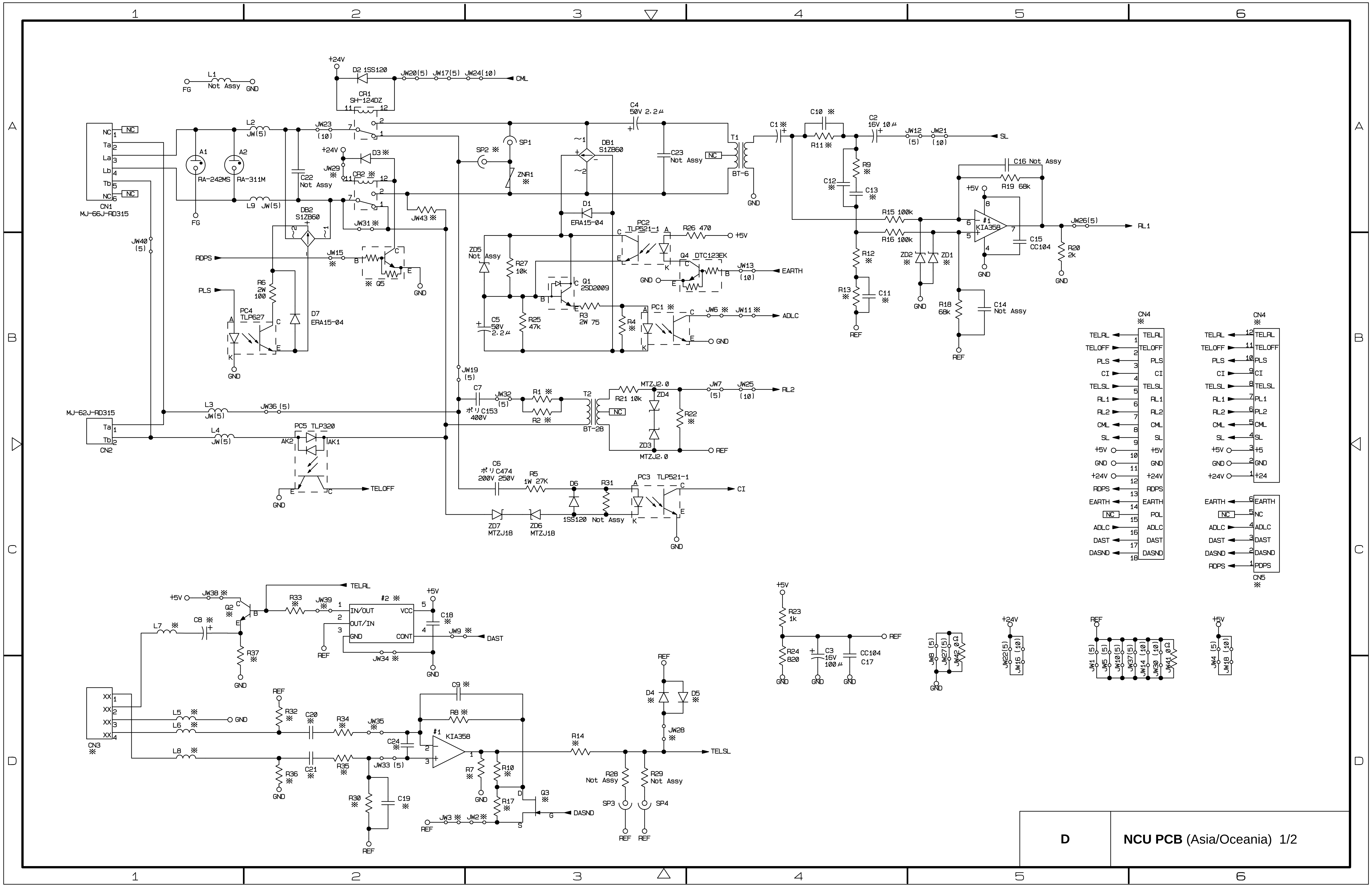


D	NCU PCB (U.S.A./Canada)



D

NCU PCB
(Germany/United Kingdom/France/Norway/Belgium/Netherlands/Switzerland/Ireland/Denmark/Austria/Spain/Italy/Sweden)



D
NCU PCB (Asia/Oceania) 1/2
CN1
MJ-66J-RD315
NC
Ta
La
Lb
Tb
NC
CN2
MJ-62J-RD315
CN3
CN4
CN5
L1 Not Assy
FG
GND
L2 JW(5)
L9 JW(5)
A1 RA-242MS
A2 RA-311M
C22 Not Assy
+24V
D2 1SS120
JW20(5) JW17(5) JW24(10)
CML
CR1 SH-124DZ
CR2
D3
JW23 (10)
JW29
JW31
JW43
DB2 S1ZB60
RDPS
JW15
Q5
PLS
R6 2W 100
PC4 TLP627
D7 ERA15-04
C4 50V 2.2μ
SP1
SP2
ZNR1
DB1 S1ZB60
C23 Not Assy
T1 BT-6
D1 ERA15-04
PC2 TLP521-1
R26 470
+5V
ZD5 Not Assy
R27 10k
Q1 2SD2009
Q4 DTC123EK
JW13 (10)
EARTH
C5 50V 2.2μ
R25 47k
R3 2W 75
R4
PC1
JW6 JW11
ADLC
C1
C10
C2 16V 10μ
JW12 (5) JW21 (10)
SL
R11
R9
C12
C13
C16 Not Assy
R19 68k
R15 100k
R16 100k
#1 KIA358
C15 CC104
JW26(5)
RL1
R20 2K
R12
R13
C11
ZD2 ZD1
R18 68k
C14 Not Assy
REF
JW19 (5)
C7
JW32 (5)
R1
R2
T2 BT-28
R21 10k
MTZJ2.0
ZD4
ZD3
R22
JW7 (5) JW25 (10)
RL2
C153 400V
L3 JW(5)
JW36(5)
L4 JW(5)
JW40 (5)
PC5 TLP320
AK2 AK1
TELOFF
C6 C474 200V 250V
R5 1W 27K
D6 1SS120
R31 Not Assy
PC3 TLP521-1
CI
ZD7 MTZJ18
ZD6 MTZJ18
TELRL
TELSL
POL
DAST
DASND
JW38
Q2
R33
JW39
#2
IN/OUT
OUT/IN
VCC
CONT
C18
JW9
JW34
L7
C8
R37
L5 L6 L8
R32
C20
R34
JW35
C9
R8
C24
KIA358
R14
D4 D5
JW28
R36
C21
R35
JW33 (5)
R7
R10
R17
Q3
R30
C19
JW3 JW2
R28 Not Assy
R29 Not Assy
SP3 SP4
R23 1k
R24 820
C3 16V 100μ
CC104 C17

ASSY	NCU B53K479 ASSY ASIA W/O TEL	NCU B53K479 ASSY OCEANIA W/O TEL
ADRS.	NAME	NAME
ZNR1	Not Assy	ENC121D07A
SP2	Not Assy	1/16W 0
CR2	Not Assy	SH-124DZ
Q5	Not Assy	DTC123EK
D3	Not Assy	1SS120
JW15	Not Assy	JW(10)
JW29	Not Assy	JW (5)
JW31	JW (5)	Not Assy
JW43	1/16W 0	Not Assy
PC1	Not Assy	Not Assy
R4	JW (5)	JW (5)
JW6;JW11	Not Assy	Not Assy
ZD1;ZD2	Not Assy	Not Assy
R1	1/4W 22K	Not Assy
R2	1/4W 22K	JW (5)
R9	1/16W 1% 4.7K	1/16W 1% 2.7K
R11	1/16W 1% 910	1/16W 1% 1.10K
R12	1/16W 1% 2K	CERAMIC 16C224B
R13	1/16W 1% 9.1K	1/16W 1% 3.9K
R22	Not Assy	1/16W 20K
C1	ALUM-ELEC 16B100	ALUM-ELEC 50B10-1
C10	Not Assy	CERAMIC 50C563B
C11	CERAMIC 50C103B	Not Assy
C12	Not Assy	CERAMIC 50C562B
C13	CERAMIC 16C224B	RESISTOR 0
CN3	Not Assy	Not Assy
CN5	Not Assy	Not Assy
CN4	B13B-PH	B13B-PH
Q2	Not Assy	Not Assy
R7	Not Assy	Not Assy
R8;R30	1/16W 0	1/16W 0
R14	Not Assy	Not Assy
R32;R36	Not Assy	Not Assy
R34;R35	Not Assy	Not Assy
R37	Not Assy	Not Assy
C8	Not Assy	Not Assy
C9;C19	Not Assy	Not Assy
C20;C21	Not Assy	Not Assy
C24	Not Assy	Not Assy
JW35;JW38;L5;L6;L7;L8	Not Assy	Not Assy
D4;D5	Not Assy	Not Assy
JW28	Not Assy	Not Assy
#2	Not Assy	Not Assy
R33	Not Assy	Not Assy
C18	Not Assy	Not Assy
JW9;JW34;JW39	Not Assy	Not Assy
Q3	Not Assy	Not Assy
R10	1/16W 0	1/16W 0
R17	Not Assy	Not Assy
JW2;JW3	Not Assy	Not Assy

1. 指示ナキ抵抗ノ定格電力ハ1/10Wトスル。

1. UNLESS OTHERWISE SPECIFIED, STANDARD ELECTRIC POWER OF RESISTORS IS 1/10W.

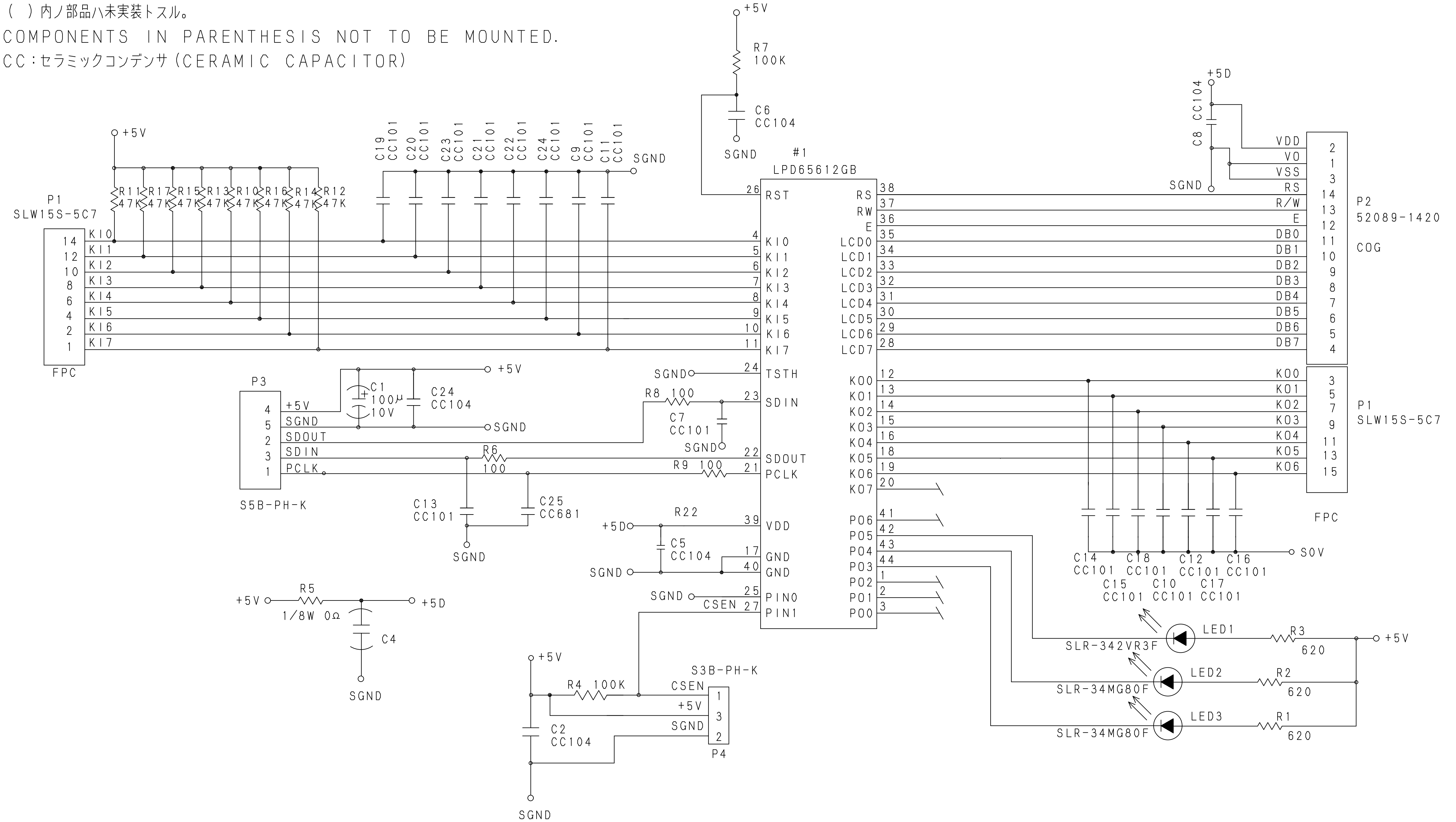
2. 指示ナキコンデンサノ耐圧ハ25V又ハ50Vトスル。

2. UNLESS OTHERWISE SPECIFIED, THE VOLTAGE RESISTANCE OF CAPACITORS IS 25V OR 50V.

3. ( )内ノ部品ハ未実装トスル。

3. COMPONENTS IN PARENTHESIS NOT TO BE MOUNTED.

4. CC:セラミックコンデンサ(CERAMIC CAPACITOR)



E	**Control Panel PCB** (MFC9800/MFC9860/MFC9880)

1. 指示ナキ抵抗ノ定格電力ハ1／10Wトスル。

1. UNLESS OTHERWISE SPECIFIED, STANDARD ELECTRIC POWER OF RESISTORS IS 1/10W.

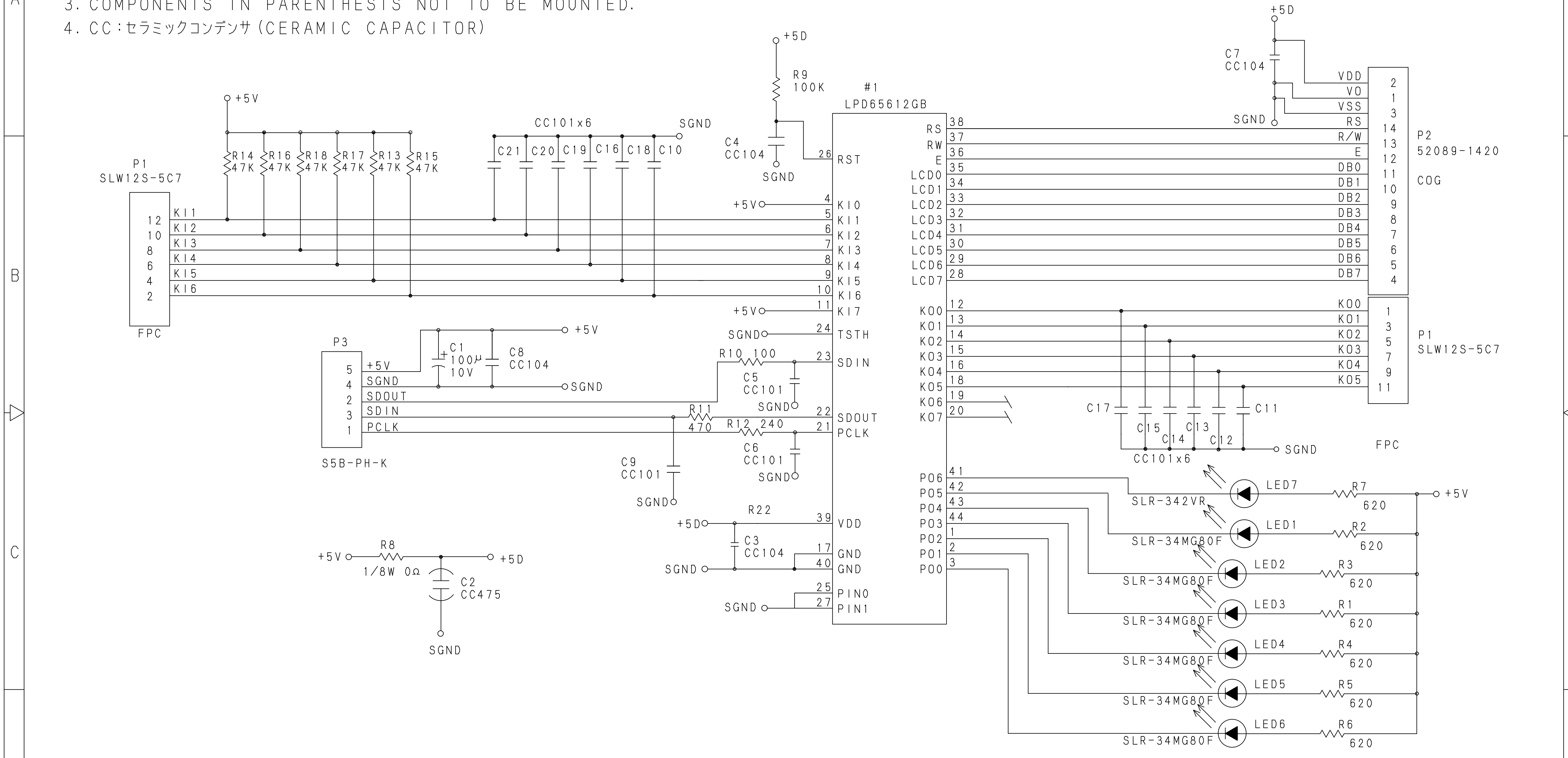
2. 指示ナキコンデ゛ンサノ耐圧ハ25V又ハ50Vトスル。

2. UNLESS OTHERWISE SPECIFIED, THE VOLTAGE RESISTANCE OF CAPACITORS IS 25V OR 50V.

3. (　)内ノ部品ハ未実装トスル。

3. COMPONENTS IN PARENTHESIS NOT TO BE MOUNTED.

4. CC:セラミックコンデンサ(CERAMIC CAPACITOR)



E	**Control Panel PCB 1/2** (DCP1400/MFC9760)

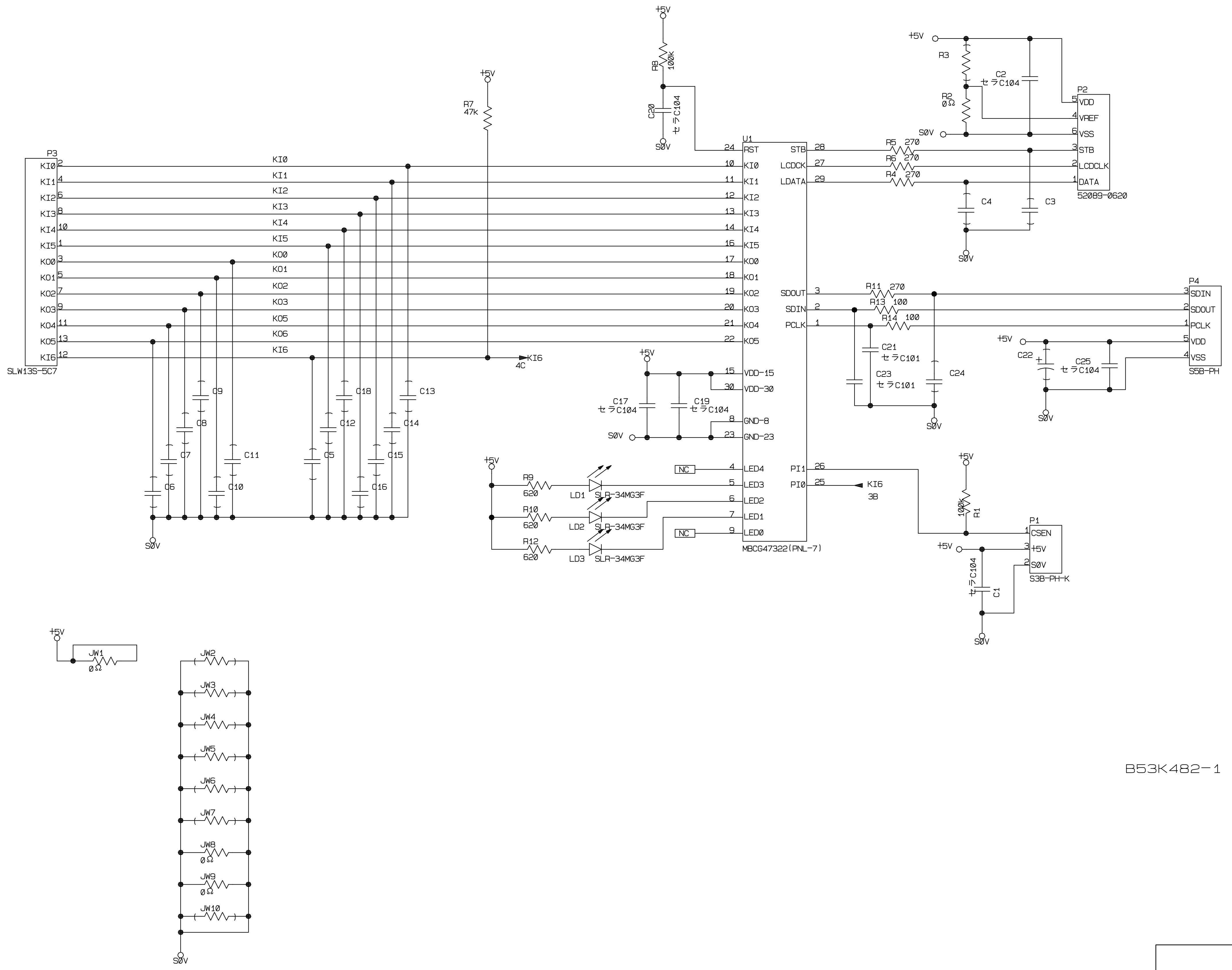
ZLFB 3IN1 PANEL KEY MATRIX REFERENCE TABLE 1

KEY NO.	KEY NAME	KEY CODE
1	Menu	26
2	Job Cancel	06
3		0E
4	B/W Scan	16
5	Color Scan	1E
6	Scan to E-mail	1C
7		24
8	Contrast	04
9	Paper Size	0C
10	Reduce	14
11	Enlarge	2C
12		23
13		1B
14		13
15	Option	03
16	Copy Mode	0B
17		2B
18	10KEY-1	1A
19	10KEY-2	1D
20	10KEY-3	2D
21	10KEY-4	2A
22	10KEY-5	15
23	10KEY-6	25
24	10KEY-7	12
25	10KEY-8	22
26	10KEY-9	0D
27	10KEY-0	0A
28	Sort	02
29	Clear	05
30	Stop	2F
31		27
32	Copy	07

ZLFB 3IN1 PANEL KEY MATRIX REFERENCE TABLE 2

	KO0 P1-1P	KO1 P1-3P	KO2 P1-5P	KO3 P1-7P	KO4 P1-9P	KO5 P1-11P
KI1 P1-12P	28	27	24	18	25	21
KI2 P1-10P	15	16	14	13	12	17
KI3 P1-8P	8	9	10	6	7	11
KI4 P1-6P	29	26	22	19	23	20
KI5 P1-4P	2	3	4	5	1	
KI6 P1-2P	32				31	30

E	**Control Panel PCB 2/2** (DCP1400/MFC9760)



B53K482-1

セラC: Ceramic capacitor

E	**Control Panel PCB 1/2** (MFC9700)

BY4FB PANEL KEY MATRIX REFERENCE TABLE 1

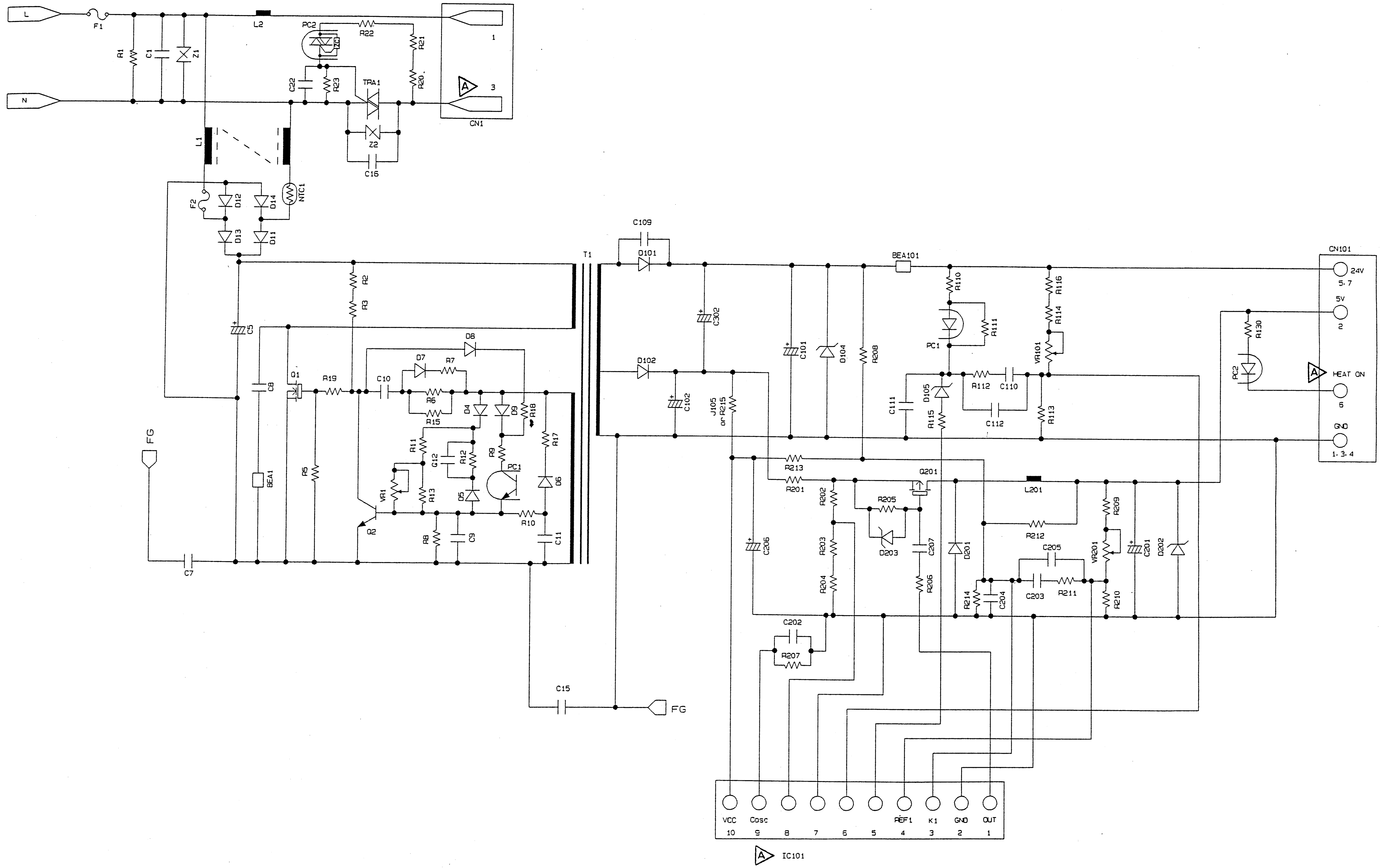
KEY NO.	KEY NAME	KEY CODE
1	1TOUCH- 1/5	2E
2	Shift	1E
3	1TOUCH- 2/6	29
4	Receive mode	19
5	1TOUCH- 3/7	2A
6		02
7	Redial/Pause	1A
8	1TOUCH- 4/8	2B
9	Search/Speed Dial	1B
10	10KEY-1	16
11	10KEY-2	0E
12	10KEY-3	26
13	10KEY-4	11
14	10KEY-5	09
15	10KEY-6	21
16	10KEY-7	12
17	10KEY-8	0A
18	10KEY-9	22
19	10KEY-*	13
20	10KEY-0	0B
21	10KEY-#	23
22	Stop	01
23	Start	24
24	Fax Resolution	0C
25	Function	14
26	←	2C
27	→	1C
28	Set	15
29	Enlarge/Reduce	25
30	Options	0D
31	Reset	2F
32	Ink Management	1F
33	Scan Image	17
34	Scan/OCR	0F
35	Scan to E-Mail	27
36	Mono Copy	2D
37	Color Copy	1D

BY4FB PANEL KEY MATRIX REFERENCE TABLE 2

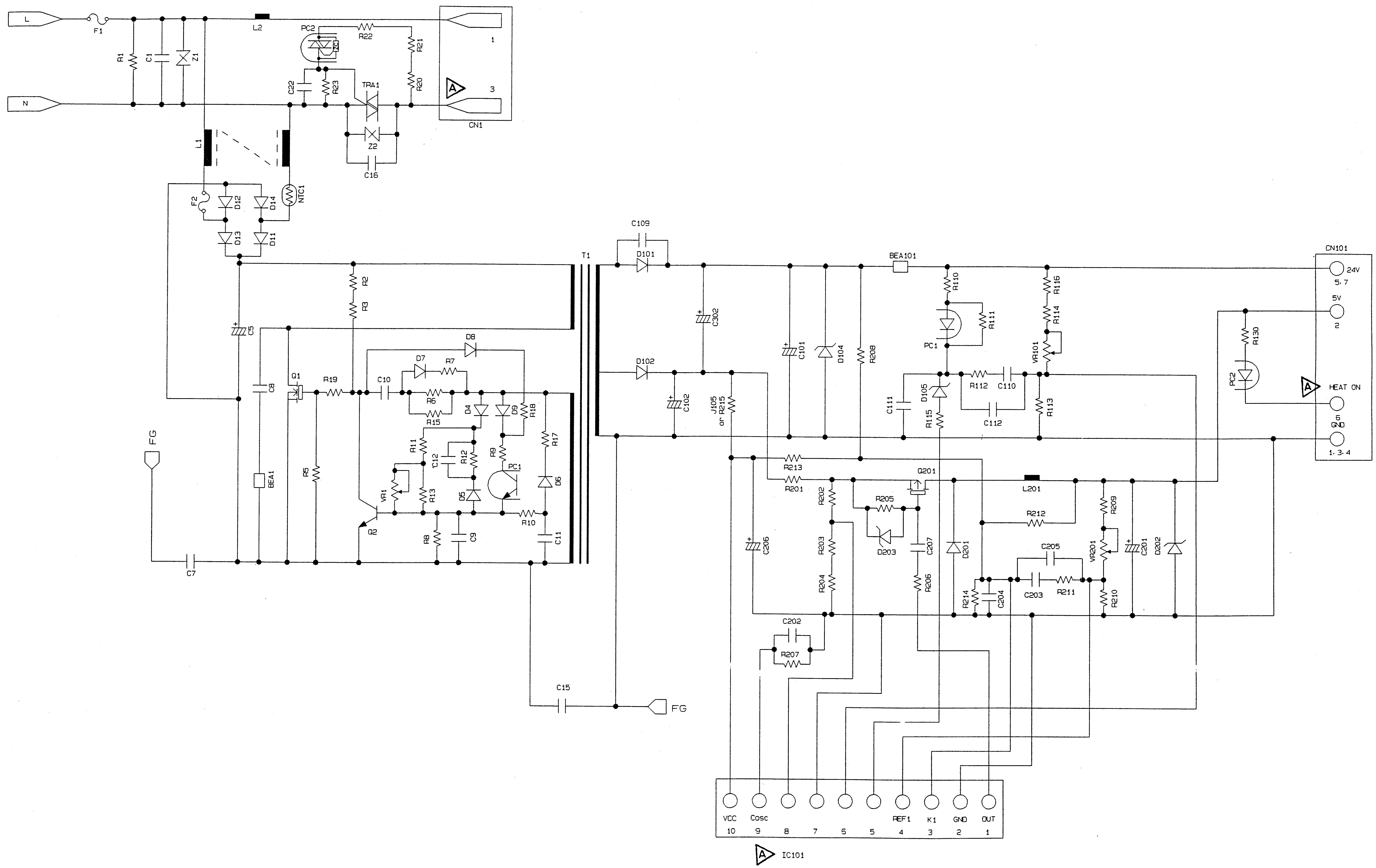
	KO0 P3-3P	KO1 P3-5P	KO2 P3-7P	KO3 P3-9P	KO4 P3-11P	KO5 P3-13P
KI0 P3-2P	22	14	13	4	15	3
KI1 P3-4P	6	17	16	7	18	5
KI2 P3-6P		20	19	9	21	8
KI3 P3-8P		24	25	27	23	26
KI4 P3-10P		30	28	37	29	36
KI5 P3-1P		11	10	2	12	1
KI6 P3-12P		34	33	32	35	31

E

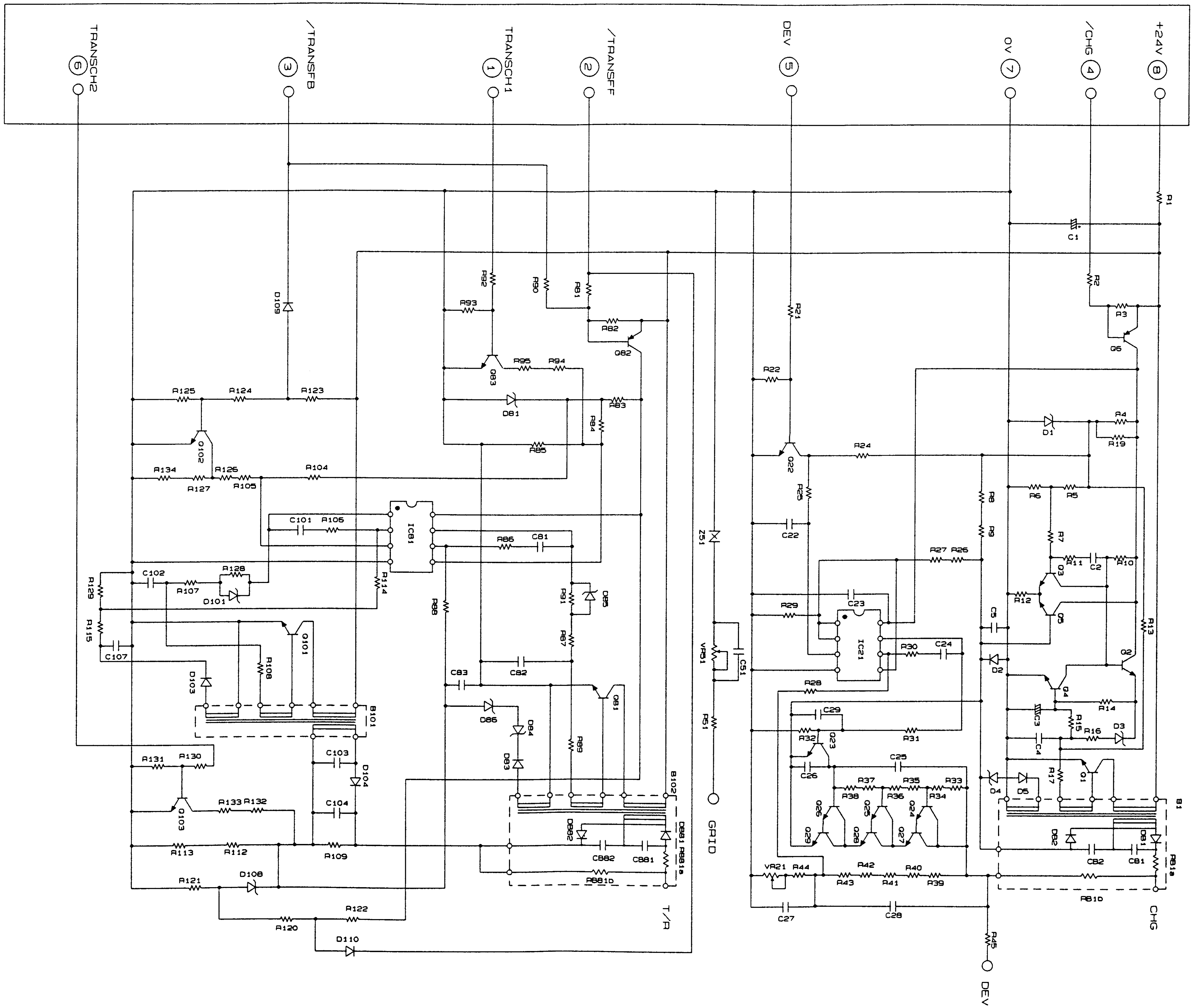
Control Panel PCB 2/2
(MFC9700)



F	**Power Supply PCB (100-120V)** Low-voltage power supply



F	**Power Supply PCB (200-240V)** Low-voltage power supply



F	**Power Supply PCB** High-voltage power supply

Jan. ’02
SM-FAX006①
8C5505
Printed in Japan